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THE WORLD BANK

WATER RESOURCES SECTOR STRATEGY

**STRATEGIC
DIRECTIONS FOR
WORLD BANK
ENGAGEMENT**



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WATER RESOURCES SECTOR STRATEGY

**STRATEGIC DIRECTIONS FOR
WORLD BANK ENGAGEMENT**

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CONTENTS

Acknowledgments v

Overview and executive summary 1

- Progress in ideas and practice 1
- Scope and methodology of this Strategy 1
- The main messages of this Strategy 2
- Notes 4

1. Introduction and development context 5

- The gloomy arithmetic of water 5
- Water resources management and development are critical to the World Bank's strategic objectives of sustainable economic growth and poverty reduction 5
- The World Bank's borrowers face a wide range of water development and management challenges 11
- Water management must make a series of important transitions 12
- The scope of this Strategy 12
- Key strategic issues in the main water-using sectors 13
- Notes 25

2. Stocktaking and evaluation 28

- Building on the 1993 Strategy and consulting with stakeholders 28
- There is broad consensus on what constitutes good water resources management, but all countries are far from managing water resources according to these principles 28
- A wide variety of water resources challenges in the regions 29
- World Bank engagement in water resources development and management 32
- The great challenge is making progress, not achieving perfection 37
- The World Bank position on the "Guidelines" of the World Commission on Dams 37
- The comparative advantage of the World Bank and the need to revise business practices 38
- Notes 39

3. Strategic options and possible business implications 41

- The additionality and focus of this Strategy 41
- Developing a portfolio of analytic work that informs management decisions and recognizes differences 42
- Working with partners 43
- Finding new sources of financing for water resources infrastructure 43
- Dealing with risk and developing a more effective business model 45

How the World Bank is organized and staffed for water resources management 49

Notes 52

4. What the Strategy might mean for World Bank engagement: Some examples from the regions 53

Illustration 1: What the new sector Strategy might mean in Brazil 53

Illustration 2: What the new sector Strategy might mean in Central Asia 56

Illustration 3: What the new sector strategy might mean in India, in particular in the state of Andhra Pradesh 59

Illustration 4: What the new Sector Strategy might mean in Nigeria 63

Illustration 5: What the new Strategy might mean in the Philippines 65

Illustration 6: What the new sector Strategy might mean in Yemen 67

Illustration 7: What the new sector Strategy might mean for the World Bank's work on international waters: The Nile Basin Initiative 70

Implementing the sector Strategy in the World Bank's operations:

What these examples show 72

Notes 73

Abbreviations 74

Annex 1: The World Bank position on the Report of the World Commission on Dams 75

Support for strategic planning, and a dams planning and management action plan 76

World Bank policies 76

Summary 78

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OVERVIEW AND EXECUTIVE SUMMARY

Many developing countries face daunting water resources challenges as the needs for water supply, irrigation and hydroelectricity grow; as water becomes more scarce, quality declines and environmental and social concerns increase; and as the threats posed by floods and droughts are exacerbated by climate change. As a consequence, there is a high and increasing demand for World Bank engagement. Lending for water resources development and water-related services accounted for about 16 percent of all World Bank lending over the past decade.

Progress in ideas and practice

In 1993 the Board of the World Bank endorsed a Water Resources Management Policy Paper (WRMPP).¹ In that paper, and in this Strategy, water resources management comprises the institutional framework (legal, regulatory and organizational roles), management instruments (regulatory and financial), and the development, maintenance and operation of infrastructure (including water storage structures and conveyance, wastewater treatment, and watershed protection). The 1993 Policy Paper reflected the broad global consensus that was forged during the Rio Earth Summit of 1992. This consensus stated that modern water resources management should be based on three fundamental principles (known as “the Dublin Principles”). First is the *ecological principle*, which argues that independent management of water by different water-using sectors is not appropriate, that the river basin should be the unit of analysis, that land and water need to be managed together and that much greater attention needs to be paid to the environment. Second is the *institutional principle*, which argues that water resources management is best done when all

stakeholders participate, including the state, the private sector and civil society; that women need to be included; and that resource management should respect the principle of subsidiarity, with actions taken at the lowest appropriate level. Third is the *instrument principle*, which argues that water is a scarce resource and that greater use needs to be made of incentives and economic principles in improving allocation and enhancing quality.

A decade later, evidence is accumulating on experience with implementing the Dublin Principles. First, experience shows that the Dublin Principles have provided inspiration and direction for many water reform processes and that the Principles remain powerful, appropriate and relevant. Second, a major review of industrialized countries by the Organisation for Economic Co-operation and Development (OECD) has concluded that progress in implementation has been difficult, slow and uneven and that even the most advanced countries are far from full compliance with the Dublin Principles. Third, another review (by the World Bank Operations Evaluation Department, OED) of the experience of the World Bank concluded that, while the 1993 Policy Paper remained relevant and appropriate, the major challenge was developing context-specific, prioritized, sequenced, realistic and “patient” approaches to implementation.

Scope and methodology of this Strategy

Managing water resources involves a dialectic between integration (Dublin Principle 1) and subsidiarity (Dublin Principle 2). Within the World Bank, business strategies for specific water-using sectors (such as water and

Water resources management and development are central to sustainable growth and poverty reduction

The main management challenge is not a vision of integrated water resources management but a “pragmatic but principled” approach

sanitation, irrigation and drainage, and hydropower) are, in accordance with the subsidiarity principle, determined primarily as part of the strategies for these sectors. This Strategy focuses on how to improve the development and management of water resources, while providing the principles that link resource management to the specific water-using sectors.

Since implementation is the focus of the Strategy, its preparation relied heavily on reviews of on-the-ground experience in implementing World Bank projects. Both the brainstorming and review stages involved much work in the field, and extensive consultations (14 in all) in developing countries. These investigations and consultations identified areas where World Bank assistance was going well and others that were less successful, and then honed in on practices that the Bank needs to change to become a better development partner. The country consultations were supplemented with consultations on the draft Strategy with specific stakeholder groups. There were also extensive and intensive consultations with Bank staff, management and the Board.

In these consultations, two distinct classes of challenges emerged that need to be faced if the World Bank is to be an effective partner. The first set of challenges relates to the many areas of water resources management where there is broad consensus, where Bank practices have changed for the better and where the need is for “more of the same.” They include more attention to water quality, conservation, groundwater management, watershed management and institutional reform. The World Bank has increased its activities in these vital areas over the past decade and will continue to increase such lending. Precisely because there is momentum and because there are no particular barriers to Bank engagement with these issues, no major changes of course are required, and there is no need for Bank management and the Board to focus specifically on them. These issues—which are very important and constitute the majority of activities with which the Bank is involved—are thus treated briefly in this Strategy.

The second set of challenges relates to a few fundamental areas where there is no global

consensus, where the Bank has not charted a consistent set of rules of engagement and where, as a result, the Bank has not performed as a predictable, timely and effective partner. This Strategy focuses primarily on these difficult and contentious issues where World Bank practice needs to improve.

The main messages of this Strategy

Message 1: Water resources management and development are central to sustainable growth and poverty reduction and therefore of central importance to the mission of the World Bank. Effective water resources development and management play a fundamental role in sustainable growth and poverty reduction, through four different mechanisms. First, broad-based water resources interventions, usually including major infrastructure such as dams and interbasin transfers, provide national, regional and local benefits from which all people, including poor people, can gain. Second, because it is usually poor people who inhabit degraded landscapes, poverty-targeted water resources interventions designed to improve catchment quality and provide livelihoods for poor people are of major importance. Third, broad-based water service interventions (aimed at improving the performance of utilities, user associations and irrigation departments) benefit everyone, including poor people. And fourth, poverty-targeted water service interventions (such as water and sanitation and irrigation services for the unserved poor) play a major role in reaching some of the Millennium Development Goals. In most developing countries growth-oriented, poverty-reducing water resources strategies will involve action in all four areas. The corollary is that the World Bank should be available as a “full service partner” to assist development of integrated, prioritized and consistent action in all four arenas.

Message 2: Most developing countries need to be active in both management and development of water resources infrastructure. For the World Bank to be an effective partner, it must approach water resources challenges without preconceptions. The Bank must not fall into the trap of thinking that all problems can be

solved with infrastructure, or the equally dangerous trap of assuming that even in environments with minimal infrastructure all problems can be addressed through better management.

Message 3: The main management challenge is not a vision of integrated water resources management but a “pragmatic but principled” approach that respects principles of efficiency, equity and sustainability while recognizing that water resources management is intensely political and that reform requires the articulation of prioritized, sequenced, practical and patient interventions. To be a more effective partner, the Bank must be prepared to back reformers and to pay more explicit attention in design and implementation to the political economy of reform. This means that solutions will have to be tailored to specific, widely varying circumstances and that the art of reform is in picking the low-hanging fruit first, not in making the best the enemy of the good; in recognizing broader reforms outside of the water sector (often relating to overall economic liberalization, fiscal and political reform) in providing the pre-conditions for improving resource and service management; and in recognizing that those who are willing to change must design reform programs and must be supported.

*Message 4: Providing security against climatic variability is one of the main reasons industrial countries have invested in major hydraulic infrastructure such as dams, canals, dykes and interbasin transfer schemes. Many developing countries have as little as 1/100th as much hydraulic infrastructure as do developed countries with comparable climatic variability. While industrialized countries use most available hydroelectric potential as a source of renewable energy, most developing countries harness only a small fraction. Because most developing countries have inadequate stocks of hydraulic infrastructure, *the World Bank needs to assist countries in developing and maintaining appropriate stocks of well-performing hydraulic infrastructure and in mobilizing public and private financing, while meeting environmental and social standards.**

Message 5: There is a large and increasing demand from the World Bank’s borrowers for

*lending and nonlending services related to water resources development and management. The ability of the Bank to respond has been mixed. On the very important “soft” side, Bank engagement is growing, rapidly and effectively. But for the many countries that need to make major infrastructure investments to complement management reforms, the Bank is often a reluctant, unpredictable and expensive partner. To be a more effective partner, *the World Bank will re-engage with high-reward–high-risk hydraulic infrastructure, using a more effective business model.* This new business model, which will be followed by both the Bank and the International Finance Corporation (IFC), puts development impact first, assesses the development impact of both engagement and nonengagement by the Bank, considers the rights and risks of those directly and indirectly affected by such projects, meets social and environmental standards, treats projects supported by the Bank as corporate projects from the start, rewards and supports staff who manage such projects, and aims at transparent, crisp, time-bound and predictable decisions.*

Message 6: The Bank is perceived by many to have a major comparative advantage in the water sectors, and there is, accordingly, a strong demand for Bank services and a strong demand that the Bank engage. There are two dimensions to the Bank’s comparative advantage. On the one hand, as water challenges grow in scale and complexity, the Bank is perceived as one of the few institutions that can provide integrated support on the macro-economic, financial, technical, social and environmental dimensions. On the other hand, borrowers find that the Bank is unique in convening power, relations with almost all riparian countries, a combination of knowledge and financial resources, engagement at all scales (local watershed, city, irrigation district, river basin and aquifer, country, regional) and ability to integrate across these. And the Bank, IFC, and Multilateral Investment Guarantee Agency (MIGA) play an indispensable role in attracting much-needed investment by the private sector.² There is simultaneously growing concern that, by disengaging from difficult, complex issues, the Bank is losing its credibility as a full-service investment and knowledge partner. In

Most developing countries need to be active in both management and development of water resources infrastructure

**The World Bank
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hydraulic
infrastructure**

particular, the Bank must be engaged in a complete range of water infrastructure and management activities in countries that have investment choices if the Bank is to remain a credible knowledge institution, since it is often experience in these countries that is relevant to poorer countries.

Message 7: The Bank's water assistance must be tailored to country circumstances and be consistent with the overarching Country Assistance Strategies and Poverty Reduction Strategy Papers. The 1993 Policy Paper and this Strategy can necessarily provide only broad principles for World Bank engagement and not inflexible prescriptions. What is appropriate in a particular country (or region) at a particular time will involve adaptation of these general principles to the specific economic, political, social, cultural and historical circumstances. An important new instrument developed in this Strategy is the Country Water Resources Assistance Strategy, which will pull together three different strands. The first strand is the specific water resources challenges, development opportunities and policies in a particu-

lar country at a particular time. The second strand is the framework that the government and the World Bank have agreed on for the next three years. The third strand contains the broad principles articulated in the World Bank's 1993 Policy Paper and in this Strategy. The resulting Country Water Resources Assistance Strategies will provide an explicit program of Bank lending and nonlending support in water that is consistent with the Poverty Reduction Strategy Paper and the Country Assistance Strategy and that will govern the Bank-country partnership in water for the next three years.

Notes

1. World Bank. 1993. *Water Resources Management: A World Bank Policy Paper*. Washington D.C.
2. Both the IFC and MIGA participated actively in development of this Strategy. While fully supporting the messages of the Strategy, the IFC and MIGA are independent institutions and thus this Strategy is formally an IBRD/IDA, not a Bank Group strategy.

1. INTRODUCTION AND DEVELOPMENT CONTEXT

The gloomy arithmetic of water

The World Commission on Water has described the “gloomy arithmetic of water.”¹ During the past century, while world population tripled, the use of water increased sixfold. Irrigation accounts for 70 percent of global water withdrawals, industry for 20 percent and municipal use for 10 percent. The increased use of water has come at high environmental costs: some rivers no longer reach the sea, 50 percent of the world’s wetlands have disappeared in the past century, 20 percent of freshwater fish are endangered or extinct, and many of the most important groundwater aquifers are being mined, with water tables already deep and dropping by meters every year, and some damaged permanently by salinization.

The World Commission on Water estimates that water use will increase by about 50 percent in the next 30 years. An estimated 4 billion people—one half of the world’s population—will live under conditions of severe water stress in 2025, with conditions particularly severe in Africa, the Middle East and South Asia. Compounding the relative scarcity of water is the continuous deterioration in water quality in most developing countries. Again, it is the poorest countries and poorest people who are most directly affected.

This gloomy arithmetic of water is mirrored in the gloomy arithmetic of costs. While low-cost, often community-based solutions can and should be further exploited, the “easy and cheap” options for mobilizing additional major sources of supply for human needs have mostly been exploited. Many countries are now facing sharply increasing unit costs (often associated with interbasin transfers or desali-

nation, and as often associated with the challenges of quality as with those of quantity).

Population and economic growth, and greater appreciation of the value of water in ecosystems, mean that water demands are growing and shifting. Tensions over water rights are increasing at the level of the village, city and basin. Some of these disputes are spilling over to international river basins.

Shifting patterns of precipitation and runoff associated with climate change compound this gloomy arithmetic. An inability to predict and manage the quantity and quality of water and the impacts of droughts, floods and climatic variability imposes large costs on many economies in the developing world. If the computer simulations on climate change are correct, these impacts will only heighten in the coming decades.

Water resources management and development are critical to the World Bank’s strategic objectives of sustainable economic growth and poverty reduction

The mission of the World Bank is poverty alleviation. Water development and management are relevant to poverty reduction in a number of different and complementary ways. Figure 1.1 provides a rudimentary but useful typology for assessing how water management affects poverty. Type 1 interventions are broad-based water resources interventions (including major water storage infrastructure) that provide national and regional economic benefits to all, including the poor. Type 2 interventions improve water resources management

Water development and management are relevant to poverty reduction in a number of different and complementary ways

f1.1 How water interventions affect poverty

		Nature of intervention	
		Broad	Poverty-targeted
Affecting water	Resources, development and management	Type 1 Broad regionwide water resource interventions For example, multipurpose river basin development and aquifer management	Type 2 Targeted water resource interventions For example, watershed management in degraded areas with poor farmers
	Service delivery	Type 3 Broad impacts through water service delivery reforms For example, reform of water supply utilities and water user associations for irrigation management	Type 4 Targeted improved water services For example, rural water supply and sanitation projects

Source: World Bank staff.

The dynamics of risk associated with water resources variability play out from the level of the household to that of the nation state

(such as watershed projects in degraded environments) in ways that directly benefit poor people. Type 3 interventions improve the performance of water service utilities, which benefit everyone, including the poor. Type 4 interventions provide targeted services (including water and sanitation, irrigation and hydropower) to the poor.

Type 1 interventions: Broad policies and investments that affect the development and management of water resources

The dynamics of risk associated with water resources variability play out from the level of the household to that of the nation state. Where variability is great, investment patterns are adjusted to mitigate these risks. At the household level, water availability and variability contribute significantly to the risks that poor people face in their daily lives, and this uncertainty constrains their economic expectations and their willingness to invest. Individuals will attempt to mitigate, or to adopt coping strategies to address, the risks posed by rainfall variability. If, however, it is uneconomic or infeasible to put in place measures that substantially mitigate the risks of rainfall variability farmers will be less likely to invest in land improvements and capital-intensive inputs and production technologies. Similarly, where water supply is unreliable, fewer

enterprises will invest, and those that do will often construct independent water supplies, such as private boreholes. Countries faced with extreme climate variability also incur large opportunity costs in adapting to the effects of water-induced shocks to the economy.

There is abundant evidence of the broad economic impacts of droughts and floods: the Zimbabwe drought of the early 1990s was associated with an 11 percent decline in GDP,² the recent floods in Mozambique led to a 23 percent reduction in GDP³ and the 2000 drought in Brazil led to a halving of projected economic growth.⁴ As articulated by a finance minister for India, “every one of my budgets was a gamble on rain.”⁵

An obvious and historic response to this rainfall variability is to mitigate the effects by investing in water storage. A particularly informative example comes from Europe. In temperate Europe rainfall is relatively regular, and there is natural regulation through lakes, groundwater storage and wetlands. This natural regulation means that over 40 percent of runoff is available for productive uses. In the semi-arid Iberian peninsula, the situation is dramatically different, with under 10 percent of runoff available through natural regulation. The responses have been logical—the countries of the Iberian peninsula have 150 times

more storage capacity per person than do France, Germany and the United Kingdom.⁶

Major water resources projects often form the basis for broad regional development, with significant direct and indirect benefits for poor people (and others). Major water development projects in Brazil,⁷ India,⁸ Malaysia⁹ and the United States¹⁰ show large direct benefits (from irrigation and hydropower) and indirect benefits that are typically twice as large. In many cases poor people benefit enormously from this economic activity. In Petrolina in Northeast Brazil, for example, water infrastructure has been the basis for the development of a dynamic rural economy. This has meant the creation of a large number of high-quality, permanent agricultural jobs (40 percent held by women). And for every job in agriculture, two jobs have been created in the supporting commercial and industrial sectors. These opportunities have meant a reversal in the historic pattern of out-migration, with the benefiting districts growing at twice the state average.¹¹

Similarly in India, water infrastructure has evened out the seasonal demand for labor, resulting in major gains for the poor.¹² Recent analyses in India have shown that irrigation infrastructure has a major impact on the returns to investments in education. “The return to five years of primary schooling versus no schooling in Indian districts where agricultural conditions were conducive to the adoption of Green Revolution technologies was high (32 percent) whereas in districts where conditions were not conducive estimated returns to schooling were negative.”¹³ This multitude of direct and indirect impacts has a striking impact on poverty: in unirrigated districts 69 percent of people are poor, while in irrigated districts poverty drops to 26 percent.¹⁴

Changes in policies have a similarly substantial impact on opportunities for poor people. For example, in 1992 Mexico passed a new water law that introduced radical changes in the way water is managed. Most important was giving users much greater say and introducing tradable water rights. In some areas the effects have been dramatic, with substantial reductions in the (unsustainable) pumping of aquifers, and with water moving from traditional low-value crops to new

high-value crops. Each drop of water now produces much higher economic returns and each hectare of land and each drop of water now generate a direct demand for more than twice as much agricultural labor (and therefore opportunities for poor people).¹⁵

It is these broad, systemic impacts that have made water-related infrastructure an essential building block for regional and national development in many OECD countries (Japan, the Netherlands, Norway, Spain, the western United States and others) and developing countries (among them Brazil, Egypt, Mexico, Pakistan, South Africa and Thailand). Recent research by the World Bank has shown that the average incomes of the poorest fifth of society rise proportionately with overall average incomes.¹⁶ So too do the poor generally benefit from these systemic growth-inducing investments in water resources management and infrastructure. In Tamil Nadu in India, for example, it was hypothesized that it was large farmers who had benefitted most from the green revolution. A landmark study showed that large farmers did, indeed, benefit—their incomes increased by 18 percent over the course of a decade. But by far the biggest winners were, paradoxically, the landless, whose income increased by 125 percent as a result of the large increase in demand for their labor.¹⁷ The appropriate image is not “trickle down” but “a rising tide lifts all boats.”

The importance of water development as a source of growth-oriented sustainable poverty alleviation was highlighted at the 2002 World Summit on Sustainable Development. The official declaration of the summit emphasizes the role that hydropower can play in poverty reduction in developing countries, recognizes all hydropower as a renewable source of energy and calls for increased support for developing countries’ efforts to develop hydropower and other renewable sources of energy.¹⁸

The growth and poverty reduction potential of such infrastructure has been undercut in two important ways. First, too often the means has become the end. Instead of assessing different options for meeting human needs and considering structural and nonstructural alternatives, there has often been a rush to build

The importance of water development as a source of growth-oriented sustainable poverty alleviation was highlighted at the 2002 World Summit on Sustainable Development

Cooperation on international waters can provide a vital component for broad-based economic development and regional security

major infrastructure. In too many instances the result was the construction of dams and other infrastructure that were economically, socially and environmentally destructive. Second, such infrastructure projects often paid little attention to particular and vital groups of poor people: those who had to be resettled and those who were adversely affected by changes in river flows. Too often the idea was that these sacrifices were “for the greater good” and therefore justified. Some of the World Bank’s greatest and most publicized failures have involved the financing of dams that were planned and built without sufficient attention to social and environmental consequences. In recent decades thinking and practice have changed dramatically, and there is now a broad consensus that those directly affected must be made the first beneficiaries of such infrastructure, and growing experience that, with commitment and ingenuity, this is usually possible.

Finally, cooperation on international waters can provide a vital component for broad-based economic development and regional security. A number of the largest water management interventions by the World Bank, dating back to the Indus Water Treaty of 1960 and extending forward to current projects (including the Lesotho Highlands Water Project and regional initiatives for the Mekong and Nile) fall into this category. While all citizens in the riparian countries reap the direct economic benefits of such cooperation, there is also often a security dividend that, under certain circumstances, can be a powerful catalyst for broader cooperation, growth and security. These broad benefits do not bypass poor people; on the contrary, it is poor people who are the most vulnerable to insecurity and who are accordingly the particular, albeit indirect, beneficiaries of such cooperation. The Global Environment Facility has played an important role in catalyzing cooperation on international waters and in bringing the environmental benefits of such cooperation to the fore.

Type 2 interventions: Poverty-targeted policies and investments that affect the development and management of water resources

In recent years it has become widely understood that better management of water

resources requires greater attention to management of the land-water interface. There are several different perspectives on this. There is growing evidence that the services provided by hydraulic infrastructure are dependent on how land in the catchment is managed. There is also growing evidence that communities living in vulnerable land-water environments (such as eroded mountains, salinized plains and the floodplain) can benefit greatly from the improved opportunities that arise when local land and water resources are managed more effectively. Accordingly, there has been a surge in projects—including projects financed by the World Bank—that focus on land and water management activities that simultaneously increase the livelihoods of poor people (who constitute a large proportion of the population in these degraded environments) and improve the quality of the land and water resources.

Two projects in the World Bank’s portfolio in the Ganges Basin are outstanding examples of the success of such approaches. The Shivalik Hills Watershed Management Project seeks to scale up the lessons from many successful watershed management projects led by non-governmental organizations (NGOs). The project aims at simultaneously reducing erosion, increasing groundwater recharge and improving the livelihoods of poor people. The major investments are in building terraces, establishing small check structures in eroded ravines, planting vegetative cover on denuded hills, building small dams and digging wells and canals that make better use of the preserved water resources. The Uttar Pradesh Sodic Lands Project in the plains works with poor, usually landless, people living in areas where land has been degraded by salinization. The project organizes groups of landless farmers into small cooperatives and provides technology and advice on land reclamation. A notable feature of the project is that while the men in the farmers cooperatives failed to manage the important credit component, women’s micro-credit groups have filled the vacuum and constitute an indispensable element in the overall success of the project.

An interesting variant—stimulated by the recognition of dam owners that upper catchment management is imperative for maintaining the value of their assets—is co-

operative watershed management. Thus, for example, the proposed Nam Theun 2 Hydro-power Project in Lao PDR provides support for communities to improve management of the catchment. Similarly, private companies that operate the water concessions in Manila are investing in catchment management to preserve the quality and quantity of the water on which the city depends.¹⁹

Finally, early efforts at better management of ecological flows from dams have had impressive results for poor people. Fishers in the Senegal River in Mauritania, for example, saw their annual catches increase from 10 tons a year to 110 tons after the operating rules for a hydropower dam were changed to allow for artificial floods.²⁰

The bottom line is that there are (as highlighted in the World Bank's recent Environment Strategy²¹) many opportunities for simultaneously improving resource management and the lives of poor people. Such win-win projects constitute a substantial and growing part of the World Bank's water resources portfolio.

Type 3 interventions: Broad policies and investments that affect the development and management of water services

Abundant evidence shows that poor people suffer most when water services (water supply, irrigation and hydroelectric power) are badly managed.²² In city after city in the developing world unserved poor people pay 10 or more times the price for a liter of water than do their fellow citizens who are served by formal supplies. The corollary is that poor people benefit immensely when they live in a town where water is supplied by a modern, accountable and financially viable utility that can extend services to a larger number of users. To cite just one case, the concession contract in Buenos Aires has meant that 1.5 million more people (most of them poor) now have access to piped water and that 600,000 more people (most of them poor) now have access to sewerage connections.²³

Put simply, water utility reform usually means substantial benefits for poor people.

An important element of the overall impact on poor people is the impact on poor women. In most countries it is women who fetch and carry water, and it is women who suffer disproportionately when services fail poor people. Because of this gender reality, women can and should play a central role in programs that address the water and sanitation needs of poor people.

The irrigation story is more complex, because water services are just one of several critical inputs (along with seeds, fertilizer, information, credit and marketing). There is growing evidence that, as in urban areas, transparency and participation benefit poor people. Thus in the Liuduzhai Project in the Yangtze Basin in China, for example, the introduction of water user associations has led to greater transparency, lower costs and better and more services to poor people.²⁴ Other cases suggest more complex but equally important pathways through which poor people benefit from broad reforms in irrigation management.

A particularly interesting case is the irrigation projects in Northeast Brazil, where the initial model—five hectare lots to poor farmers—was ostensibly pro-poor but in fact meant that expensive infrastructure was being used for subsistence agriculture, because the poor farmers were unable to solve endemic technology, credit and marketing problems. An apparently antipoor change in policy (auctioning off 50 percent of new areas to “commercial farmers”) ushered in a growth-stimulating and poverty-reducing cycle. The commercial farmers were able to address the issues of technological innovation, credit and marketing. Poor farmers benefited in two ways. First, the poor farmers piggy-backed on the opportunities created by the commercial farmers, often becoming subcontractors to these farmers. Second, the poor farmers benefited by finding employment in the industries that grew up to supply inputs and process the products of this now-dynamic agricultural sector.²⁵ The key conclusion is that water infrastructure and market-oriented reforms (which are often decried as “antipoor”), when well-designed, can be the basis for growth and opportunities for the poor.

Water utility reform usually means substantial benefits for poor people

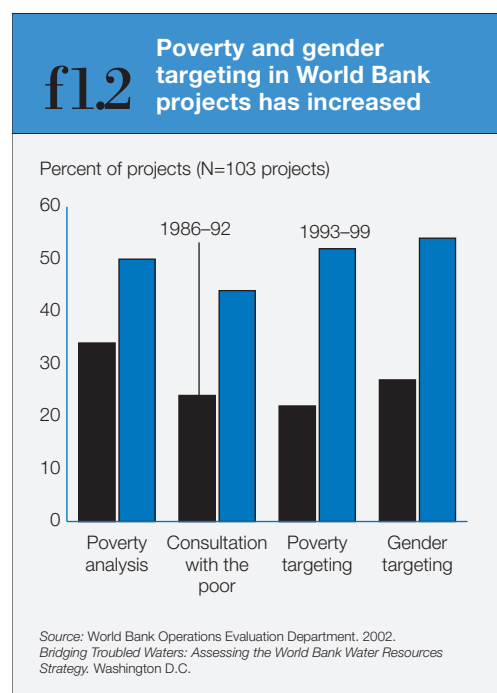
Type 4 interventions: Poverty-targeted policies and investments that affect the development and management of water services

Poverty-targeted policies and investments are the classic and most obvious way in which water projects affect poverty, with documentation most complete for urban water supply. Those who are excluded from formal services (always poor people) typically pay much more for water than do those who receive formal services (always the better off).²⁶ Accordingly, poverty-targeted rural and urban water and sanitation projects are very important for the poor. These projects are almost always accorded high priority by communities in rural development and slum upgrading programs and form a growing part of the World Bank's water and sanitation portfolio. Similarly, giving smallholders access to improved and appropriate irrigation technology (such as treadle pumps) has important impacts on the lives of poor people.

Summary on water resources and poverty

There are several main observations on water resources and poverty:

- Water resources management policies and investments affect poor people in a variety of direct and indirect ways, most of which are important in most contexts.
- There has been substantial improvement in how World Bank-financed water projects directly address poverty and social concerns (figure 1.2).
- There are important distinctions in the fiscal implications of different interventions. Broad interventions (types 1 and 3) generally stimulate growth and revenue, whereas targeted interventions (types 2 and 4) usually depend on subsidies.
- There are also important distinctions between the impact of management interventions (where the benefits are often indirect and long term) and the impact of development projects (which are direct and immediate).
- There are distributional distinctions between the poverty impact of rehabilitation (which benefits those who benefited from the initial investments) and new projects



(which benefit new people and which are, other things equal, more equitable).

An appropriate strategy for countries is a blend of all of these interventions: operating on the resource and on water services, intervening in a broad, systemic manner, and directly targeting the poor. For example, well conceived water infrastructure should:

- Provide the basis for overall regional development and associated economic opportunities for poor people (type 1 benefit).
- Have components that aim at improving watershed management, with associated benefits for poor people who usually constitute the majority of people living in such degraded environments, and develop operating rules that specify ecological flows for the benefit of downstream riparians (type 2 benefit).
- Be associated with reform of the power, irrigation and water supply sectors, with broad benefits from which poor people, and especially poor women, benefit (type 3 benefit).
- Provide targeted benefits to poor people who are resettled or otherwise affected by the project or who live in the vicinity of the project, and generate revenues that are dedicated in part to specific pro-poor activities (type 4 benefits).

t1.1 Water resources management and the Millennium Development Goals targets

Target and description	Relevant water interventions (from figure 1.1)
Target 1 , which aims at reducing the proportion of people whose income is less than \$1 a day.	Types 1 and 2 , through their contribution to overall and targeted economic growth. Types 3 and 4 , through better general and targeted growth-inducing services.
Target 2 , which aims at reducing the proportion of people who suffer from hunger.	Types 1 and 2 , through their contribution to overall and targeted economic growth, food production and hunger reduction. Types 3 and 4 , through better general and targeted growth-inducing and food-producing services.
Target 5 , which aims at reducing the mortality rate of children under five years old.	Types 1 and 2 , through their contribution to overall and targeted economic growth and thus mortality reduction. Types 3 and 4 , through better general and targeted services, some of which (such as irrigation) increase income and thus reduce mortality and some of which (water supply and sanitation) directly reduce mortality.
Target 9 , which aims at integrating the principles of sustainable development into country policies and programs.	The Dublin ecological, institutional and instrument principles, incorporated into the World Bank's Water Resources Management Policy, are the broadly accepted principles for sustainable water resources development. This Strategy focuses on how to make these principles effective in country policies and program.
Target 10 , which aims at reducing the proportion of people without sustainable access to safe drinking water.	Types 1 and 2 , through their contribution to overall and targeted economic growth and thus demand and willingness to pay for better services. Types 3 and 4 , through better general and targeted water supply services.

Source: World Bank staff.

An important task is to translate this typology into guidance to ensure that water is fully and appropriately incorporated into Poverty Reduction Strategy Papers (PRSPs) and into the Country Water Resources Assistance Strategies. The Water Resources Management Group, which brings together the regional and sectoral leadership on water across the World Bank, has started this work. This will include mapping “down” to ensure that macro actions benefit poor people, both directly and indirectly; mapping “up” to assess the broader implications and sustainability of local water actions; and integrating actions to ensure consistency and synergy across the four types of interventions illustrated in figure 1.1.

Finally, water resources management is directly relevant to several of the international development targets set by the UN Millennium Assembly in October 2000 (table 1.1).

The World Bank's borrowers face a wide range of water development and management challenges

The World Bank's client countries confront two major water resources challenges. First, all countries face major challenges in developing the laws, regulations and institutions required for managing water resources in a more

economically productive, socially acceptable and environmentally sustainable fashion. Improved resource and demand management is therefore appropriately given high priority by the World Bank and many of its borrowers. The Dublin ecological, institutional and instrument principles²⁷ provide a compass, but the details have to be tailored to the historical, cultural, environmental, social, economic and political circumstances of each country.

Second, all countries face a major challenge in developing and maintaining an appropriate stock of water infrastructure. Framing this challenge is the reality that the costs of water infrastructure are rising rapidly in many countries. An analysis of World Bank repeater water supply projects shows that the cost of bulk water for the future project is often two to three times greater than that for the previous one.²⁸ The World Commission on Water has estimated that investments in water infrastructure in developing countries need to increase from the current level of about \$75 billion to \$180 billion a year over the next 25 years.²⁹

In meeting these challenges, circumstances differ among countries. In Central Asia, for example, where extensive water infrastructure is fast decaying, a key challenge is triage—deciding what infrastructure to rehabilitate, given environmental and economic

The World Commission on Water has estimated that investments in water infrastructure in developing countries need to increase from about \$75 billion to \$180 billion a year over the next 25 years

constraints and the dependence of more than 35 million people on the maintenance of this infrastructure. In other developing countries there is significant underdeveloped potential, as suggested by the following comparisons. Australia and Ethiopia have similar degrees of climate variability, but whereas Australia has 5,000 cubic meters of water storage capacity per person, Ethiopia has 45 cubic meters.³⁰ The United States and Nepal have roughly equivalent economically exploitable hydropower potential, but whereas installed hydropower capacity in the United States is about 70,000 megawatts (MW), in Nepal it is less than 600 MW.³¹

This Strategy does not focus on the water-using sectors but on water resources management and the connections between resource use and service management

Water management must make a series of important transitions

To meet these water resources challenges, a series of transitions is under way, with major implications for water management:

- *From development or management to development and management.* For decades water resources management was equated with construction of water infrastructure. Experience showed this to be a major error, for economic, social and environmental reasons. In reaction, some have stigmatized dams, dykes, canals and other major hydraulic infrastructure as unnecessary and destructive. The emerging view is that both extremes are wrong and that in most developing countries both management improvements and priority infrastructure have essential and complementary roles in contributing to sustainable growth and poverty reduction.
- *From local to regional and international management.* Water management is moving from being just a local issue to being a national and an international issue, requiring new approaches to financing, dispute prevention and resource management.
- *From disputes to cooperation.* Growing demand for water for cities, industries and the environment means a greater need for consensual mechanisms (from the local to the international level) for dispute prevention and resolution and for flexible, voluntary methods for reallocating water in response to changing demands and values. Water can be a cause of

conflict; alternatively it can be a major catalyst for cooperation at all levels—even economic integration. Experience has shown that cooperative programs for water resources management have been important to regional integration and stability in Eastern Europe (the Baltic Sea), Southeast Asia (Thailand and Lao PDR), South Asia (the Indus Basin) and Southern Africa (Lesotho Highlands).

- *Toward public-private partnerships.* Much of the necessary hydraulic infrastructure is multifunctional (such as reservoirs that generate electricity and protect against floods). Financing for water resources infrastructure is not cleanly separable into public and private sectors; increasingly, it requires public-private partnerships, both in investment and operation. While private investment and management are playing, and must play, a growing role, this must take place within a publicly established long-term development and legal and regulatory framework, and without crowding out community-managed infrastructure and beneficiary participation in design and management of water systems. Attracting private investment into low-income countries is particularly important and necessarily a major focus for institutions like the World Bank.

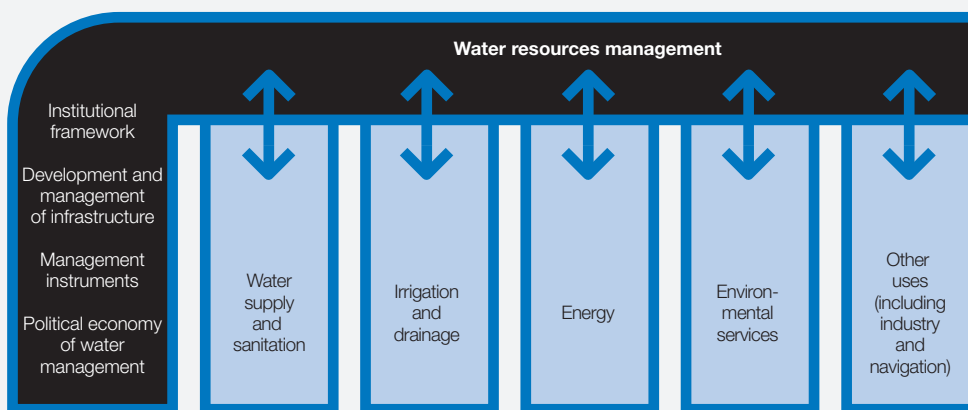
The scope of this Strategy

Water management can be conceptualized as a “comb,” in which the “teeth” are the water-using sectors and the “handle” is the resource itself, defined by its location, quantity and quality (figure 1.3).

This Strategy does not focus on the water-using sectors (which are addressed in other World Bank sector and business strategies,³² including energy, environment, rural development, irrigation and drainage, and water supply and sanitation) but on water resources management and the connections between resource use and service management. This means addressing:

- *The institutional framework,* including the definition and establishment, at levels ranging from local watershed management institutions to international basin

f1.3 Scope of this Strategy: A focus on water resources management, not services



Source: Global Water Partnership Technical Advisory Committee, 2000. *Integrated Water Resources Management*. Stockholm: Global Water Partnership.

agencies, of laws, rights and licenses; of responsibilities of different actors; and of standards for water quality and service provision (especially to poor people), for the environment, for land use management and for the construction and management of infrastructure that affects the quantity and quality of water resources.

- *The management instruments*, including regulatory arrangements, financial instruments, standards and plans, mechanisms for effective participation of stakeholders, and knowledge and information systems that increase transparency; motivate effective water allocation, use and conservation; and secure maintenance and physical sustainability of the water resources systems.
- *The development and management of infrastructure* for annual and multiyear flow regulation, for floods and droughts, for multipurpose storage, and for water quality and source protection.
- *The political economy of water management and reform*, in which there is particular emphasis on the distribution of benefits and costs and on the incentives that encourage or constrain more productive and sustainable resource use.

Key strategic issues in the main water-using sectors

As is obvious from figure 1.3, there is symbiosis between resource management and

service sectors. While the details of the water-using sectors are appropriately managed at the sector level, the linkages between resource management and the service sectors are central to overall resource management and thus to this Strategy.

Application of the principle of subsidiarity is not a matter of Cartesian mechanics, but one of judgment and art. Since use of water always precedes concerns with resource management, the culture and principles of the major water-using sectors have a profound influence on the ways in which societies approach the challenges of water management. When specific water-using sectors make heavy use of water resources, a strategy for resource management must closely examine the internal workings of those sectors. Although World Bank approaches for water-using sectors are addressed in detail in other sector strategies and business plans, it is pertinent here to outline the main relevant features of these companion strategies, focusing on the links to the management of water resources.

Irrigation and drainage and water resources management

Increased world food security is one of the great development achievements of the last 40 years. Over this period, despite rapid population growth, per capita grain production increased 30 percent, and average daily

The culture and principles of the major water-using sectors have a profound influence on the ways in which societies approach the challenges of water management

caloric intake increased from 2,000 to 2,800. This remarkable achievement has been driven by increases in yield as a result of the green revolution, and a sharp increase in irrigated area, from 110 million hectares in 1950 to 280 million in 2001. Irrigated agriculture, which accounts for less than 20 percent of farmed land, contributes 40 percent of the world's food production.³³

The World Bank has played a central role in the irrigation sector in developing countries. Although World Bank investments in irrigation have declined sharply in recent years (with project numbers and investment levels in the late 1990s only 40 percent of the levels 20 years earlier), the World Bank remains a major actor both directly and through key partnerships, including the Consultative Group for International Agricultural Research (CGIAR).

The Rural Board is developing an Irrigation and Drainage Business Plan, to be presented to the World Bank Board as part of an overall Agriculture and Food Security Strategy in fiscal 2003. While respecting the principle of subsidiarity, and without preempting the upcoming Irrigation and Drainage Business Plan, this section outlines the challenges facing the sector in some detail because in no other water-using sector is the relationship between the sector and overall water resources management so large and so fraught with daunting institutional and political obstacles.

First, irrigation is by far the largest user of water globally, accounting for an estimated 85 percent of water use in developing countries.³⁴ Second, many of the conflicts between water development and environmental sustainability are, at their core, conflicts between irrigation and environmental conservation. Large-scale diversion of rivers and pumping of aquifers have adversely affected wetlands, fisheries, coastal and marine ecosystems and the populations that depend on them; inadequate drainage has led to large-scale waterlogging and salinity; and reclamation of flood plains for irrigation has increased vulnerability to flooding. Third, while the irrigation philosophy of the 1960s through the 1980s, of continuous publicly financed expansion, has run its course,

a new one has yet to take its place. The irrigation community is still a long way from:

- Making a transition from the era of expansion and construction to an era of intensification and management.
- Articulating and operationalizing a modern institutional model that unbundles the bulk infrastructure from the distribution infrastructure, separates the public and private aspects of the systems and clarifies the public roles (legal framework and regulation) and private (profit and nonprofit) roles for service delivery.
- Articulating sound, achievable, sequenced approaches to cost recovery for different components of irrigation and drainage systems.

There is broad agreement among borrowers and the professional irrigation community that the World Bank has an indispensable role to play in this vital reform process, both because of the major role it has historically played in irrigation and because of its ability to access and integrate the wide range of institutional and technical skills required.

Drawing on a broad basis of sector work, OED reports and external assessments, the World Bank is formulating a new strategy for the irrigation and drainage sector, with fundamental implications "on the farm" and for the management of water resources.

The on the farm elements of this reform agenda include:

- *Increasing the productivity of water and infrastructure.* World Bank-financed activities aim at higher productivity (more crops, cash and jobs per drop) through a combination of means—economic, institutional, agronomic (cropping patterns, intensification), hydrological (reducing nonbeneficial evapotranspiration), and ecological (salinity management, waterlogging control, deficit irrigation, water harvesting in rain-fed areas).
- *Developing a realistic, sequenced approach to cost recovery.* For decades there has been a yawning gap between simple economic principles (farmers should pay the full financial costs—operation and maintenance, rehabilitation, debt servicing on

Although World Bank investments in irrigation have declined sharply in recent years, the World Bank remains a major actor both directly and through key partnerships

existing infrastructure—and the opportunity costs of water) and on-the-ground reality. In developed countries, in the words of the OECD, “agricultural water use is still heavily subsidized,” and in developing countries farmers typically pay only a fraction of operation and maintenance costs and nothing for rehabilitation and amortization of investments. In the Indian state of Rajasthan, for example, the state pays 75 percent of the costs of operation and maintenance of irrigation, with these costs amounting to 18 percent of the state’s recurrent budget.³⁵ As discussed in more detail later, the key to better cost recovery is a changed set of institutional arrangements and incentives and much greater attention to the political economy of moving from here to there.

- *Scaling up user associations and ensuring that they are representative of all farmers.* The past decade has seen a revolution in the role of farmers in irrigation, with the World Bank playing a powerful advocacy and demonstration role. Water user associations empower users to operate and maintain their systems, collect fees, hire professionals and manage water rights. They have proved effective for increasing efficiency and productivity; for improving accountability, performance and responsiveness to farmers; and for improving the financial sustainability of irrigation systems. An important element of such reforms is to ensure that women, who often play a major but undervalued role in irrigation, are specifically included in such associations.
- *Modernizing formal irrigation institutions and the framework in which they operate.* While there have been gains from water user associations, it has also become clear that irrigation reform has to be fully supported by institutional reform. If the agencies themselves are not modernized, then user associations cannot function effectively and eventually are undermined. Reforming public sector agencies, which currently manage most of the world’s large irrigation systems, is arguably the number one priority for improving overall performance of the irrigation sector. As with other infrastructure services, increased accountability and a competitive environment are vital for improving performance.

- *Explicitly addressing the political economy of reform.* Perhaps the greatest of all challenges in the irrigation sector is the articulation of a prioritized, sequenced and sellable program for getting from here to there. While the pace and content of reform processes are necessarily place and time specific, World Bank experience suggests that there are two overriding rules governing such processes. First, the impetus for change typically comes from a crisis, sometimes (such as a water quality disaster or declining water tables) within the sector, but more often outside because of an overall fiscal crisis or process of political reform. Experience further suggests that the World Bank is most effective when staff remain aware and able to take advantage of exogenous opportunities, concentrating the World Bank’s convening and investment resources to back reformers. Second, given the very large vested interests (not only millions of farmers, but, in just one state in India, over a hundred thousand public sector employees in the irrigation department), a reform program must deal as much with issues of fiscal and civil service reform as it does directly with irrigation issues. Here the World Bank, given its comprehensive engagement with governments, has a comparative advantage, which it is now starting to use more consistently and more strategically, for example, in state-level reform in Brazil and India.
- *Supporting partnerships that focus on the production of new crop technologies.* While institutional reforms are crucial, it is evident that the water–environment–food production square cannot be circled without the development of new generations of crop varieties. Accordingly, a high priority for the World Bank is support to the CGIAR for the development of crops that are less susceptible to droughts, floods and salt, that result in more production per unit of water use, that are less vulnerable to pests and spoilage and that use smaller quantities of water-polluting fertilizers and pesticides.

The irrigation reform agenda items that have major implications for water resources management include:

The greatest of all challenges in the irrigation sector is the articulation of a prioritized, sequenced and sellable program for getting from here to there

Recognizing and managing water rights is essential for managing irrigation systems and for managing river basins and aquifers

- *Greater attention to basinwide efficiency.* The arithmetic of water conservation is not a simple matter. In some circumstances, field efficiency is important because return flows degrade land and water resources. In other circumstances, one farmer's water loss is another farmer's recharge, and improved farm-level irrigation efficiencies often result in only paper, not real, water savings. Required is an improved, customized understanding of water balances and water quality in specific basins, so that the benefits from often costly interventions to reduce farm and system losses are assessed in terms of the contribution to overall basin water use efficiency and water quality. Such understanding includes determining how much water can be consumptively used on a sustainable basis while still meeting environmental and other in-stream flow requirements and without overexploitation of groundwater.
- *Increased emphasis on drainage.* Underinvestment in drainage has meant that an estimated 30 million hectares have become unproductive as a result of the twin curses of waterlogging and salinity, and large amounts of water are lost through nonbeneficial evapotranspiration. Accordingly, public and private investments in drainage are imperative for arresting the decline of the resource base on which irrigated agriculture (and much of the world's food supply) depends and for maintaining the health of rivers and wetlands. A central element in the World Bank's overall push for irrigation sector modernization is the development of a portfolio of investments and management tools to address the financing and institutional arrangements for development and maintenance of drainage and environmentally sustainable disposal of drainage water.
- *Recognizing and managing water rights.* Recognizing and managing water rights is as essential for managing irrigation systems as for managing river basins or aquifers. Doing that in most countries first requires clarifying that water is publicly owned and that a water right is usufructory—it is a right to use, not a right to own water. The essence of this change is that water rights (of individuals and

communities, including traditional users) enjoy the same legal certainty as land and other property rights. Once established, such rights give rise to a series of fundamental and healthy changes. First, those requiring additional resources (such as growing cities) will frequently be able to meet their needs by acquiring the rights of those who are using water for low-value purposes. Second, there are strong incentives for low-value water users to voluntarily desist, making reallocation both politically attractive and practical. Third, the establishment of formal water rights gives rise to strong pressures for improving the data required to manage the resource. And fourth, this reduces the pressures of a "race to the bottom," since those who have rights have a powerful interest in sustainability.

This is not to suggest that there is unanimity on the concept of water rights, for some see this as an unhealthy commodification of a public good. Nor is it meant to imply that it is simple to introduce rights-based systems for a fugitive resource with deep cultural implications in administratively weak environments. Nonetheless, there has been substantial progress in recent years (in Brazil, Chile, Mexico and South Africa), and there are pressures from the local level (villagers who have stored rainwater in Rajasthan, for instance) to the international level (between the United States and Mexico, for example) to define the rights to use an ever-scarcer resource.³⁶ The World Bank is gaining practical experience in the legal and administrative machinery for setting up and managing rights-based systems of water management.

- *Reducing perverse subsidies for groundwater pumping.* The most dynamic and progressive actors in the irrigation sector in many developing countries are the numerous farmers who use groundwater. In contrast to the heavily-subsidized surface irrigation systems, groundwater farmers typically pay the full financial costs of well drilling, pumps and irrigation systems. In many countries, however, groundwater farmers have managed to obtain and defend large subsidies for their biggest recurrent cost, electricity. In conjunction with a lack of property rights (and associated problems

in managing common pool resources), the energy subsidies have meant heavy over-exploitation of groundwater. It is estimated that 10 percent of the world's food supply is based on unsustainable pumping of groundwater.³⁷ Phasing out such subsidies is simultaneously an economic and environmental necessity and a daunting political challenge. There is some evidence, from Mexico, for example, that progress can be made when these perverse subsidies are replaced in a carefully phased manner with "virtuous subsidies" (such as for investments in modern irrigation equipment).³⁸

In summary, in many developing countries the irrigation and drainage sector is at a crossroads. Irrigated lands must produce greater quantities of the food and fiber required to feed and clothe growing populations. In most countries this growth cannot come from mobilizing additional land and water resources (as was done in the past), but must come from getting more out of less—more crop, cash and jobs per drop. This new era requires institutions that are radically different from the top-down, construction-oriented irrigation agencies that developed over the past half century. The World Bank's borrowers see the Bank as an indispensable partner in effecting this transformation. They perceive the World Bank to have a unique combination of legitimacy, institutional and technical skills, knowledge, advocacy and financing power, and they look to the World Bank for leadership in revitalizing the sector. Many are concerned about a perceived decline of the World Bank's interest in and commitment to irrigation and drainage. Borrowers and other partners, accordingly, give high priority to the process and outcome of the planned Irrigation and Drainage Business Plan.

Energy and water resources management

There is now a broad consensus—exemplified in the World Bank's recent Energy Sector Business Strategy³⁹—on what constitutes a sound energy sector. Central concepts include the importance of financial and environmental sustainability, and the need to distinguish the roles of electricity providers

(increasingly private) and those of legislation, regulation and planning (the vital role for the state). The Energy Sector Business Strategy emphasizes such issues as stimulating competition among energy suppliers; developing and strengthening objective, transparent regulation; establishing commercial pricing and enterprise viability; and expanding private sector participation. The Energy Sector Business Strategy also articulates a role for the World Bank, IFC, and MIGA in mitigating risks beyond the control of private investors and private risk insurers, in spreading lessons of reform and in internalizing local and global environmental externalities.

These broad modernizing reforms in the electricity sector have had profound implications for water resources management in countries that depend heavily on hydroelectricity. They have meant a broad acceptance that hydropower developments (particularly those involving storage) should be planned, optimized, designed and operated in the basin context in cooperation with other water-using sectors. (Although, as with most other aspects of water management, practice lags behind principle. Even in well developed environments such as Chile, for example, there remain substantial challenges in reconciling the management of hydropower facilities with the needs of downstream populations.⁴⁰)

These reforms also have meant that the owners of dams have increasingly realized that substantial amounts of storage (0.5–1.0 percent globally) are lost each year due to sedimentation and that sediment management in catchments and dams is vital to maintaining asset value. Responsible hydropower developers have become strong advocates for good environmental and social practice, as articulated, for example, in the report of the World Commission on Dams.⁴¹ This includes extensive consultation with stakeholders, ensuring that resettlement is done well, investing in community management of watersheds and ensuring that local people become beneficiaries.

World Bank and IFC experience has confirmed that hydropower projects offer windows for improving social and environmental

This new era requires irrigation institutions that are radically different from the top-down, construction-oriented irrigation agencies that developed over the past half century

performance. In countries such as Brazil and China this means building on strong domestic capacity and experience; in poor countries such as Lao PDR and Uganda it means using strong external private sector developers as a means for advancing good practice and developing local capacity.

A recent and important development is the formal recognition at the World Summit on Sustainable Development that hydropower (large and small) is a renewable source of energy and that, in the words of the Implementation Plan, there is “a sense of urgency, [to] substantially increase the global share of renewable energy sources...”⁴² This should foster mechanisms enabling environmentally and socially sustainable hydropower (small and large) to benefit from the nascent trading in carbon permits. Among the first activities of the Prototype Carbon Fund are two transactions to purchase emission reductions from small hydropower projects—\$3.9 million for a \$20 million project for displacing diesel oil with hydroelectricity from small projects in the West Nile region of Uganda, and \$3.5 million for a run-of-the-river hydropower facility set up in cascade with other hydropower projects in a \$37 million project in Chile.⁴³

Over the past decade the World Bank has drastically reduced its investments in hydropower, from about \$1 billion to about 10 percent of that amount. The changed global recognition of the role of hydropower and the strong demand from clients require a major reengagement by the Bank in the hydropower sector.

Finally, a specific but very important implication for water management is that a “modern” energy sector should not provide large hidden subsidies for groundwater pumping, one of the most environmentally destructive of perverse subsidies. Experience has shown that this is a particularly difficult and politically sensitive area. There have been only a few successes thus far in replacing destructive energy subsidies with equivalent virtuous subsidies. Mexico is a notable example of good practice, having replaced energy subsidies with subsidies for the purchase of modern, energy- and water-saving equipment.⁴⁴

Water supply and sanitation and water resources management

Just as there is a global consensus on what constitutes a sound energy sector, so too is there broad agreement on the central features of a sound water supply and sanitation sector. This agreement draws on the same principles of separating the role of provision (public and private) from that of regulation, policy formulation and assessment (a public role), and of stimulating competition among providers. While work on a new World Bank Water and Sanitation Business Plan (to be finalized in fiscal 2003) has just started, it is possible to broadly identify priority policies and approaches to their implementation within the water and sanitation sector and to describe how these relate to the management of water resources.

An overriding thrust of the World Bank’s work on water and sanitation is to ensure that poor people gain access to safe, affordable water supply and sanitation services by reducing costs and increasing accountability. In urban areas this means targeting subsidies to the poorest, largely unserved consumers to partially finance up-front costs of connection; incorporating the preferences of poor communities for service quality standards, delivery modality and management arrangements; permitting entry and fair competition between conventional utilities and small-scale service providers; and structuring contracts, regulatory incentives and legislation to facilitate extension and upgrading of services to poor communities. In small towns and rural areas this means empowering communities to make informed choices about their participation, service levels and service delivery mechanisms; realigning the rights and obligations of key stakeholders; vesting communities with ownership rights and authority to select service providers; building local capacity to support community decisionmaking in planning, management and delivery of services; and establishing financial policies and instruments that provide incentives for communities to contribute to capital costs and pay for all operation and maintenance costs. An important element of such approaches is to make sure that women can, in forms that are practical in each cultural setting, play a

role that is commensurate with their knowledge of local water services and interest in improving them.

A central part of this thrust is to stimulate the development of financially sound, operationally efficient, consumer-oriented water and sanitation utilities. This includes realigning policy, regulatory and service provision functions and governance structures to enhance accountability and incentives for distinct actors to perform; strengthening regulatory oversight capacities, institutions and processes to provide greater transparency and predictability; building commercially oriented and customer-focused utilities to ensure sustainability of service; strengthening government capacity to contract services in transparent and accountable ways; balancing remuneration with allocation of risks; increasing the creditworthiness of water providers to enhance their capacity to mobilize financing for long delayed investments in rehabilitation, upgrading and expansion; gradually raising average tariffs to reflect actual costs and instituting predictable, transparent adjustment mechanisms; eliminating generalized supply-side subsidies in favor of narrowly targeted subsidies to achieve specified outcomes and to serve poor, largely unserved households; and promoting the development of financial policies and instruments that facilitate more efficient allocation of public funds and increased access to local capital markets.

An important change in World Bank practice over the past decade has been supplementing traditional support for accountable, public sector utilities with support for private sector involvement in the provision of water and sanitation services. About 40 percent of projects it finances now involve some form of private sector participation.⁴⁵ This change has been motivated by several factors. First, while some public utilities have managed to maintain high performance over protracted periods, few poorly performing public utilities have bootstrapped themselves to achieve sustained good performance. Second, private sector involvement in developed and developing countries alike, has challenged the idea of permanent unregulated public monopolies and has stimulated public operators to improve their performance. Third, entry of

the private sector has stimulated the development of more transparent, impartial regulation and greater disclosure of information: in short, greater accountability to consumers and taxpayers. The World Bank has played an important role in this, through projects and by building hands-on, utilitywide capacity through sponsorship of the International Network of Utility Regulators.⁴⁶ Fourth and fundamental is the concern with finding better mechanisms for getting cost-effective, accountable services to the billions of people who still do not have access to water supply and sanitation services. Important as the entry of the private sector is, public utilities currently provide and will for the foreseeable future provide water to the vast majority of people in developing countries. Accordingly the World Bank continues to devote attention and resources to improving the performance of public utilities.

Experience shows that these changes in the water and sanitation sector have profound implications for the management of water resources. First, accountable utilities (public and private alike) are acutely aware that the services they provide depends on the availability of a reliable quantity of good quality raw water.⁴⁷ Second, once there is a separation between regulator and provider, the provider recognizes that it can no longer simply confiscate water from farmers and other users in times of scarcity.⁴⁸ This means that reformed utilities often become active proponents of modern water resources management: they want to participate in making resource management decisions, they want clarity on the rules and processes that govern allocation, they push for market-based rules for facilitating voluntary temporary or permanent transfer of water rights from low-value to high-value users, they become advocates of investments in sustainable watershed management and they push for pricing policies to ensure that bulk water infrastructure is maintained and operated effectively.

In the past, most World Bank water and sanitation operations dealt with the water side. In part due to a natural sequencing of demand (people first want water, then sanitation, then wastewater disposal⁴⁹) and in part due to more aggressive advocacy by the

An overriding thrust of the World Bank's work on water and sanitation is to ensure that poor people gain access to safe, affordable water supply and sanitation services by reducing costs and increasing accountability

Environmental concerns, such as legal and regulatory instruments governing water allocation, environmental assessment and pollution control, form part of the core water resources management activities

World Bank, the “dirty water” side is gaining prominence in the World Bank’s work in the sector. The World Summit on Sustainable Development also added sanitation to the Millennium Development Goals. The key issues are the sequencing of on-site and off-site investment, simultaneous consideration of the costs incurred and the benefits accrued in terms of improved downstream water quality and step-wise approaches to investments in tandem with local demand and local institutional and financial capacity. Since the setting of wastewater goals and standards is the responsibility of river basin authorities and other public water resources management agencies, close coordination is required between utilities and these bodies. Experience shows that unaccountable, financially unsustainable utilities often operate in a climate of impunity, and pay little attention to these public responsibilities. Conversely, reformed utilities that are separated from the implicit or explicit regulatory apparatus and that are accountable for their performance engage actively in devising sensible, sequenced strategies for improvement.

In summary, the institutional changes in the water supply and sanitation sector over the past decade have had profound implications not only “within the city” but “at the city gate.” This has meant that, out of enlightened self-interest, the better water utilities have become major change agents, assuming a progressive role as advocates for better water resources stewardship in many instances.

Environmental services and water resources management

The environment is, of course, a special water-using “sector,” in that most environmental concerns are a central part of overall water resources management and not part of a distinct water-using sector. Environmental concerns, such as legal and regulatory instruments governing water allocation, environmental assessment and pollution control, form part of the core water resources management activities. There are, however, as in other sectors, important environmental service activities that are typically the responsibility of environmental rather than water management agencies:

- *Terrestrial services*, including management of forests and land in watersheds, which are essential for moderating hydrological variability, reducing silt and conserving biodiversity. In the past decade there has been a rapid increase in World Bank activity in watershed management at different scales, ranging from land management of the whole of the Loess Plateau in China to community-based watershed management in the foothills of the Himalayas. As stressed in the recent Environment,⁵⁰ Rural⁵¹ and Forest⁵² Strategies, the core lesson from these experiences is ensuring that such activities produce economic benefits for local people who then have an incentive to maintain the activities. Such activities can strongly benefit the poor people who often inhabit these fragile areas. An encouraging recent development is recognition by users of downstream water infrastructure of the importance of catchment preservation. Water utilities and hydropower companies are developing innovative partnerships with upstream communities for maintenance of catchment quality, and upstream catchment enhancement is becoming a standard feature of most World Bank-financed large dam projects.
- *Aquatic services*, including the conservation and management of wetlands and floodplains, underpin the fisheries and crop production systems on which many poor communities depend and serve vital functions in attenuating extreme hydrological events. The report of the World Commission of Dams has correctly stressed that the rights of “downstream ecosystems and people” have historically been ignored.⁵³ Here, too, new forms of practice are evolving, with maintenance of ecological flows now being addressed in the design of new infrastructure and the recalibration of operating rules in river basins. The World Bank is actively engaged in bringing best practice to bear, through knowledge generation, partnerships and its operations.

An environment issue of major relevance to water resources management is climate change. The effect of climate change on stream flow and groundwater recharge

varies regionally and between climate scenarios. A consistent projection across most climate change scenarios is for increases in annual mean stream flow in high latitudes and Southeast Asia, and decreases in Central Asia, the Mediterranean, Southern Africa and Australia, although the amount of increase or decrease varies by scenario. For other areas, including mid-latitudes, there is no strong consistency in projections of stream flow, partly because of differences in projected rainfall and partly because of differences in projected evaporation, which can offset rainfall increases. The amplitude and frequency of extreme precipitation events are likely to increase over many areas, and the return periods for extreme precipitation events are projected to decrease. This would lead to more frequent floods. It is likely that global warming will increase the variability of Asian summer monsoon precipitation.⁵⁴

The historical challenge of water resources management has been the reconciliation of human needs for predictable and regular flows of water with the variable patterns of precipitation and stream flow. The challenge is, of course, particularly large where average flows are especially low and where variability is high. Societies have developed a combination of structural and nonstructural mechanisms for attempting this reconciliation. The principal lessons from the experience of industrial countries are, first, that infrastructure (dams, levies and canals) is critical, and, second, that infrastructure investments need to be complemented by previously neglected nonstructural investments (in watershed management, land use planning and information, and systems management, for example). The emphasis in infrastructure-rich industrial countries is now heavily and appropriately focused on nonstructural solutions.

Developing countries face three major challenges. The first is that many have stocks of water infrastructure that are much smaller than those of climatically similar industrial countries. There are, accordingly, major needs for priority water infrastructure to be developed following best practice, from a technical, economic, social and environmental perspective (much of which is described in the report of the World Commission on Dams). The second challenge is to invest si-

multaneously and heavily in nonstructural management solutions. Most developing countries have understood this and are now doing so (efforts range from the massive watershed management project in the Upper Yangtze catchment in China, to the development of improved hydrology data in India, to elimination of water-using invasive alien plants in South Africa.) The third challenge is that global change exacerbates, in most cases, the underlying imbalances between human demands and natural hydrologic patterns, making the task of developing an integrated package of structural and non-structural tools more urgent.

While climate change has profound implications for water resources management, the reverse is also true: properly managed, water can play a role in stabilizing greenhouse gas concentrations in the atmosphere. Hydropower can, in principle, make a major contribution to reducing the greenhouse gas intensity of energy production. Currently about 19 percent of the world's electricity is produced from hydropower.⁵⁵ While about 70 percent of hydropower potential in Europe and North America is already tapped, only 20 percent has been developed in Asia, 15 percent in Latin America and 5 percent in Africa.⁵⁶ Greenhouse gas emissions from most hydropower plants are relatively low, with the one important exception being large flat lakes in heavily vegetated tropical areas.⁵⁷

The Implementation Plan from the World Summit on Sustainable Development firmly establishes hydropower (small and large plants) as a renewable source of energy whose production should be stimulated. Given the considerable untapped hydropower potential in many developing countries, the World Bank will reverse its declining engagement in hydropower and actively support the development of small and large hydropower plants, ensuring, of course, that this is the most appropriate option and that good environmental and social practices are followed. Finally, recognition by the World Summit on Sustainable Development of hydropower as a source of renewable energy means that environmentally and socially sound hydropower plants should be eligible for revenues from the Clean Development Mechanism. An encouraging start

While climate change has profound implications for water resources management, the reverse is also true: properly managed, water can play a role in stabilizing greenhouse gas concentrations in the atmosphere

(with small hydropower plants) has been made by the Prototype Carbon Fund.

Pricing and water rights: principled pragmatism

Many countries face multiple concerns regarding the growing scarcity of water, including associated conflicts among users and ways of transferring water from low-value to high-value uses. It has often been stated that having users pay the full cost of water would solve these problems. Experience has shown the situation to be considerably more complex and nuanced, requiring more than extolling the virtues of pricing. This section outlines a different approach—one of “principled pragmatism.” *Principled* because of the importance of economic principles, such as ensuring that users take financial and resource costs into account when using water. And *pragmatism* because solutions need to be tailored to specific, widely varying natural, cultural, economic and political circumstances, in which the art of reform is the art of the possible. The general arguments are illustrated by focusing on two major users—farmers and cities. Four issues are addressed:

- The quite different economic environments that pertain in these two sectors.
- The crucial distinctions between the perspective of economists and the perspective of users on what constitutes “appropriate pricing,” and some of the practical implications of these distinctions.
- The critical distinction between the financial cost of providing a service and the opportunity cost of the resource itself, and the implications of this distinction.
- A review of some good practice developments, and the implications for a country-specific, practical, sequenced approach to dealing with these crucial issues in World Bank-financed projects.

Issue 1: The radically different markets in which irrigation and urban water operate

The first, fundamental distinction is between the markets in which urban water supply and irrigation operate. With urban water supply the product can largely be considered as a local, nontradable good. The price charged for water in Helsinki is entirely immaterial to the price charged in Timbuktu.

More specifically, if Helsinki chooses to subsidize its water users, that has no relevance to water users in Timbuktu.

With irrigation, where the end products are agricultural goods that trade on a global market, the situation is quite different. If the government of a developed country chooses to subsidize the water (and other inputs and outputs) used by its farmers, this has an impact on world prices and thus a direct impact on producers in developing countries. Since agricultural subsidies in OECD countries are huge (about \$350 billion a year),⁵⁸ this has a major impact on the prices of agricultural products in developing countries and on the economic returns from farming. These distortions reinforce the demands of farmers in developing countries for subsidies for water, energy and other inputs, usually causing further harm to the economy and the environment.

This crucial fact makes the political economy of water pricing reform especially complex (both in theory and practice) for irrigation. Experience suggests that the appropriate approach is to acknowledge the need for subsidies and to document the existing levels. Then it is possible—as has been done in Mexico, for example⁵⁹—for the government and farmers to agree on a subsidy-neutral transformation from a package of perverse subsidies (of fertilizers, pesticides and water, for example) to a package of virtuous subsidies (such as for improving land quality and for more efficient technology).

Issue 2: What economists and users understand by “appropriate pricing” and the implications for practice

Economists have long had a sound theoretical basis for assessing the resource implications of pricing, namely charging users for the marginal cost of producing the next unit of input. The rule is clear and correct, since it causes users to take into account the cost of the next unit of production when they consider using another unit of the resource. Unfortunately, even sound theory does not always translate into rules that can easily be understood and applied in practice.⁶⁰

The first reason for this is that ordinary users understand a price as a payment for a service rendered. When the supplier is a

“Principled pragmatism” stresses the importance of economic principles, such as ensuring that users take financial and resource costs into account when using water, and the need to tailor solutions to specific, widely varying natural, cultural, economic and political circumstances

monopoly (and prices are set outside of the market), users view the “legitimate” price as the cost to an efficient producer to produce the service. In economic terms, this means that users consider average, not marginal, cost to be legitimate.

Two more questions arise from this: what is included in “cost,” and what happens if the service provider is not efficient? Costs that users readily consider legitimate include the costs of operating and maintaining the existing infrastructure. And, with some explanation and communication, experience shows that users see the costs of replacement as legitimate costs. But even under the most advantageous of settings, users vigorously resist the notion that they should pay for sunk costs which, in their eyes, have already been paid for by taxes or other assessments.

The issue of the efficiency and accountability of the service provider is critical. “Why should I pay the costs of the Water Department when it is overstaffed, corrupt and fails to maintain our systems?” is a frequent and legitimate complaint from consumers and farmers. An illustration of the “lower bound” of these inefficiencies comes from the state of Victoria, Australia. Before reform, irrigation services were provided by a government department with well-trained and well-performing staff, and there was little corruption. After reform, once farmers had to pay the full costs of operation and maintenance, increased scrutiny of the supply agency led to a 40 percent reduction in these costs.⁶¹ In most developing countries the inefficiency is much greater, and users’ resistance to paying for these services is correspondingly higher. Exhortations to increase cost recovery without addressing these fundamental accountability questions are a major part of the reason why cost recovery has been so poor in many countries. An Operations Evaluation Department review of World Bank experience with irrigation shows that, despite the World Bank’s insistent advocacy of cost recovery for decades, “there is no evidence of better cost recovery or of covenant compliance either.”⁶²

The bottom line, then, is that in most urban and irrigation systems cost recovery is critical for the supply of good services. The road to cost recovery does not lie in conditionali-

ties, however, but in re-aligning the institutional arrangements so that suppliers are accountable to users, and so that charges become a principal tool used for ensuring the mutual obligations of suppliers and users.

Issue 3: The crucial distinction between financial costs and opportunity costs, and the implications for practice

User payments for the financial costs of services rendered is a fundamental requirement for any financially sustainable water supply system. This is very important. But the claims for pricing typically go beyond that of maintaining and operating infrastructure, and suggest that if “the prices are right, allocation will be optimal.”

Proceeding from the point of view of users (as one must when considering the political economy of reform rather than theoretical elegance), it is vital to distinguish between two different types of cost. First are the costs that any user can understand, the financial costs associated with pumps, treatment plants and pipes. Second is the far more subtle concept of the opportunity cost of the resource itself. There have been many proposals for doing sophisticated calculations of this opportunity cost and charging users to ensure appropriate resource allocation. This has not worked for two fundamental reasons.⁶³ First, because it is impossible to explain to the general public (let alone to angry farmers) why they should pay for something that doesn’t cost anything to produce. And, second, because those who have implicit or explicit rights to use the resource consider (appropriately) such proposals to be the confiscation of property.

Another important factor is that the ratio between financial and opportunity costs is often quite different for different sectors. Although everything in water (like politics) is local, there are two broad patterns. It costs a lot to operate the dams, treatment plants, pumps and pipes that provide households with the modest amounts of water they use. Alongside these large financial costs, the opportunity cost of the resource (as measured by the value of the raw water in its next best use, often irrigation) is typically quite low. For municipal and industrial water,

For municipal and industrial water financial costs generally dominate opportunity costs; for irrigation the opportunity cost is often much higher than the financial cost of supplying the water

To ensure that users take into account the cost of the resources they are using, the emphasis must be on financial costs for municipal supplies and on opportunity costs for irrigation

therefore, financial costs generally dominate opportunity costs. Accordingly, as described in the earlier section on water supply and sanitation, discussions of municipal water supply as an economic good focus on financial costs and on the associated issues of accountability, sustainability and transparent subsidies to ensure that poor people have access to services.

For irrigation the situation is almost exactly the opposite. It costs relatively little (per unit of water) to build, operate and maintain the usual gravity systems that provide very large quantities of water. But the opportunity cost of the water (for cities and, increasingly, for high-value agricultural uses) in situations of scarcity is often much higher (a factor of 10 in typical cases of scarcity) than the financial cost of supplying the water.⁶⁴

These numbers (remembering, of course, that every place is different) have profound implications. For ensuring that users take into account the cost of the resources they are using, the emphasis must be on financial costs for municipal supplies and on opportunity costs for irrigation. (Cost recovery for irrigation remains, as discussed above, very important for infrastructure sustainability, but not for allocative efficiency, which is the focus in this section.) The great challenge for irrigation, in light of these theoretical and practical realities, is how to have farmers take account of the opportunity cost of the resource.

In most parts of the world where water is scarce, informal water markets have arisen, in which those who have (implicit) rights sell water to those who need it. In some cases the practice has existed for hundreds of years and has been formalized (as in the Water Court of Valencia, Spain, which has managed transfers among users for a thousand years⁶⁵). In many other cases (such as Western India⁶⁶) water markets are extensive, sophisticated and illegal. Throughout the arid western United States water rights have long been legal property and, under different rules in different states, can be transferred from willing sellers to willing buyers.

As other parts of the world have experienced scarcity, and as the balance between the state and the individual has been adjusted, a

number of countries facing water stress have turned towards formal, legal, managed water markets. This happened in Chile in the 1980s, and in Australia, Mexico and South Africa in the 1990s.

From the perspective of ensuring that users take account of opportunity costs, these arrangements have a unique virtue. Once users have clear, transferable water rights, they automatically consider whether they wish to forgo a particular use of water in exchange for compensation from another user who may place a higher value on the water. Reallocating water then becomes a matter of voluntary and mutually beneficial agreements between willing buyers and willing sellers, and not a matter of confiscation or an endless search for ever more costly new sources of supply.

This is not to suggest that the establishment of water markets is simple or a panacea. The operation of such systems is demanding in terms of rules for establishing initial rights (including those for the environment and informal customary rights, especially of the poor and women, and recognition and protection of the rights of small users); the plumbing required to measure and move water; the regulatory institutions need to protect the rights of other water users and the environment and to ensure that the public interest is represented; and the information and management systems. Many consider these prerequisites to be so onerous that they cannot be made to work in most developing countries. And many point to early problems that all countries have faced in making such changes.

Without minimizing these challenges, three observations are germane. First, the prerequisites are relevant for any form of well-managed allocation system, and the absence of such prerequisites is a problem for all allocation systems, including the administrative allocation systems practiced in most countries. (As with everything in water management, the choice is not between first and second best, but between “imperfect” and “even more imperfect.”) Second, one of the many virtues of a market-based system is that, once started, there is a strong demand for better measurement, transparency, regulation and

information. Third, all such established systems, often after initial adjustments, are working reasonably well. In none of the countries that have adopted such systems is there any thought of returning to the previous allocation procedures.

Issue 4: The political economy of change and the consequences for World Bank actions

The implications for World Bank actions are clear. First for financial cost recovery the key is an institutional framework for making service providers accountable and efficient. When this happens, and when users see that their payments are used to improve the quantity and quality of services, they can and will pay. Here (as discussed in the sections on specific water-using sectors) the watchwords are “competition,” “regulation,” “transparency,” “benchmarking” and “accountability.” In urban water supply and the energy sector these ideas are common, and World Bank actions are mostly consistent with them.

In the irrigation sector, where they are little understood, the World Bank has recently become active in adapting these general institutional principles. Having made considerable progress at the users’ level, the task is now to tackle the major challenges of accountability and efficiency in public irrigation agencies. A critical element of this approach is to develop innovative mechanisms for breaking out of the typical low-level equilibrium, in which services are poor, users won’t pay, so service quality declines further. In one innovative approach the World Bank helped the government break the circle by guaranteeing a new, accountable operator a declining proportion of “reasonable costs” over a five year period.⁶⁷ In the first year, then, the operator had sufficient revenues (mostly from the IDA credit, but some from users) to improve the operation of the system. As the level of service improved, users were informed that they would be charged for the new, improved service and that, eventually, they would pay the full costs of the service.

From the point of view of opportunity costs, entitlements and markets, the World Bank has been an active partner in several cases where systemic changes have been

made in developing countries. The World Bank is also engaged in disseminating the lessons of experience and in stimulating thinking on these issues in many other countries. In all cases this requires close attention to the political economy of reform. This means, as with many other reforms, picking the low-hanging fruit first, for instance, by starting with temporary trading in well-defined systems where good infrastructure is in place; not making the best the enemy of the good, by having a well-defined, sequenced, prioritized and patient approach for moving toward improvement rather than seeking to attain perfection in one fell swoop; keeping one’s eyes peeled, by understanding that it is broader reforms outside the water sector (often relating to overall economic liberalization, fiscal and political reform) that will provide the pre-conditions for making the critical first steps in water reform.

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2. STOCKTAKING AND EVALUATION

This Strategy does not aspire to rewrite the 1993 Water Resources Management Policy Paper, but to complement it by focusing on the lessons in translating its principles into practice

Building on the 1993 Strategy and consulting with stakeholders

This Strategy, a product of the World Bank-wide Water Resources Management Group, takes as its starting point the well-received 1993 Water Resources Management Policy Paper. This Strategy does not aspire to rewrite the Policy Paper, but to complement it by focusing on the lessons in translating its principles into practice. The Strategy draws heavily on the OED report assessing experience in implementing the 1993 Policy Paper, complementing the OED findings with results of the following reviews and consultations held in preparing this Strategy:

- An assessment of the World Bank's portfolio, with reports written on—and discussed with—each region.
- In-country consultations during the data gathering stage with broad cross-sections of stakeholders in Brazil, India, Nigeria, Philippines and Yemen (with complete reports of the presentations, proceedings and conclusions posted at www.worldbank.org/water).
- In-country consultations with the governments of Brazil, China, Ethiopia, Jordan, Lao PDR, Nepal and Thailand (in the process of consulting on the report of the World Commission on Dams).¹
- A global consultation on international waters hosted by Germany in Berlin.²
- An extensive process of soliciting views on the draft Strategy. The draft Strategy was posted on the Bank's external Web site for comment, and eight external consultations were held with stakeholder groups in Brazil, India, Nigeria, Philippines and Yemen, along with special consultations with the private sector, bilateral donors and international NGOs.³

- Discussions with relevant sector boards and regions within the World Bank.
- The report of a high-level World Bank-wide panel that examined options for a new business model for World Bank engagement in high-reward–high-risk hydraulic infrastructure.

Finally, this Strategy draws on two major recent international reports—the World Commission on Water Report delivered at The Hague World Water Forum in March of 2000,⁴ and the report of the World Commission on Dams of November 2000⁵—and the recent World Summit on Sustainable Development.

There is broad consensus on what constitutes good water resources management, but all countries are far from managing water resources according to these principles

The main thrusts of the World Bank's 1993 Water Resources Management Policy Paper⁶ are consistent with the global consensus (embodied in the Dublin principles forged at the 1992 Earth Summit process and re-affirmed thereafter) that water resources should be managed holistically and sustainably, respecting subsidiarity and ensuring participation, and treating the resource as an economic as well as social good. The Operations Evaluation Department review⁷ (and the World Bank's experience) indicates that the goals of the 1993 Policy Paper remain relevant and appropriate, but that progress has been slow in getting actions on the ground.

The Policy Paper offers a vision toward which countries should be moving. While experience

has reinforced the relevance and importance of the Dublin Principles, a detailed recent review by the Organisation for Economic Co-operation and Development shows that even the most advanced countries are far from full implementation of these principles in practice, as indicated by the following excerpts:⁸

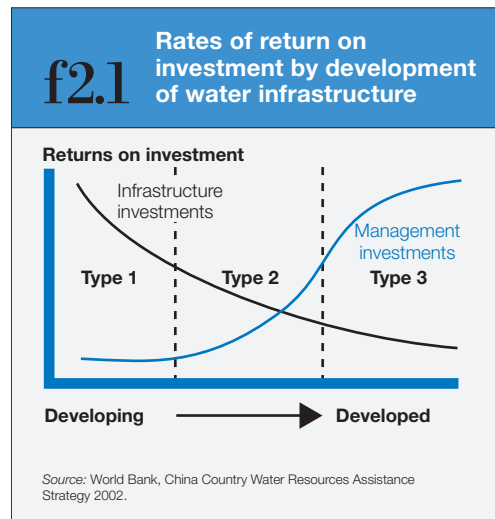
- “Insufficient progress with integrating environmental and sectoral policies.”
- “Basic water quality standards not yet met.”
- “Prices rarely reflect full economic and environmental costs.”
- “Most work in improving water use efficiency remains to be done.”
- “Demand management policies are still little developed.”
- “Agricultural water use is still heavily subsidized.”
- “The progress achieved to date is the result of many years of effort.”

The implication is not that the principles are irrelevant, or that progress is not possible. Rather it is that it takes vision, persistence and patience to make progress.

A wide variety of water resources challenges in the regions

In the Africa Region great rainfall variability militates against growth and poverty reduction. Whereas countries with temperate climates can typically use about 40 percent of annual runoff through natural regulation (baseload in streams, groundwater and water held in wetlands and lakes), in arid environments with high rainfall variability, less than 10 percent of runoff can be captured through natural regulation. In such environments artificial storage becomes a necessity. As a result of this and other factors, the levels of water-related services (water supply, irrigation and hydropower) in Africa are much lower than in other regions.

Much of the infrastructure built in Africa has been managed and operated poorly. Thus African countries give high priority to integrated programs aimed at better management of existing water infrastructure and at the development of new, growth-inducing infrastructure. Given the extraordinary den-



sity of international river basins in Africa—including the Nile, the Senegal, the Niger, the Zambezi, the Congo and the Orange—cooperation and benefit sharing on such basins present a host of opportunities and challenges in terms of developing benefit-generating infrastructure and of managing both the infrastructure and the rivers.

The countries of East Asia and Pacific, large and small, increasingly see water resources management as critical for growth, poverty reduction and sustainable development. That said, the challenges vary widely along the spectrum of situations illustrated in figure 2.1 (developed by the Bank’s East Asia and Pacific Region). Much of eastern and northern China face type 3 challenges, in which management of scarce water resources, existing infrastructure and greater attention to pollution are the major concerns. In western China the situation is more a mixed type 1 and 2, with an emphasis on harnessing the productive potential of water resources for hydropower and irrigation, and simultaneous attention to integrated basin management and watershed management. Indonesia, the Philippines, Thailand and Vietnam are also facing mixed type 1 and 2 conditions. These countries have abundant water resources but are experiencing water shortage and competition for water around large cities, as well as serious water pollution problems that will require a mix of management and infrastructure investments. In addition, large, less developed areas in these countries are in need of significant investments in infrastructure. In smaller

African countries give high priority to integrated programs aimed at better management of existing water infrastructure and at the development of new, growth-inducing infrastructure

Most countries in Europe and Central Asia inherited large stocks of water infrastructure—so large that national budgets are inadequate for maintaining the stock

countries of the Region (Lao PDR, for example) the situation is pure type 1. Here, the export of hydropower is one of the very few options for generation of revenue and use of these revenues to stimulate growth and reduce poverty.

In much of **Europe and Central Asia** the challenges are quite different. Most countries in the region inherited large stocks of water infrastructure—so large that national budgets are inadequate for maintaining the stock. In the Russian Federation, for example, it is estimated that 3 percent of hydropower generating capacity is being lost each year due to inadequate maintenance. With some important exceptions, the challenge in the region is not building more infrastructure, but developing an appropriate strategy for deciding what infrastructure will be maintained and rehabilitated, and what retired. Ensuring the safety of existing dams is an important priority.

Investments in infrastructure are needed, however, for improved drainage management and flood management in several countries. And there is potential for the large-scale development of hydropower in the upstream riparian countries of the Amu Darya and Syr Darya rivers in Central Asia. There are also needs for investments in water quality improvements in the countries to the north and west of the region, primarily in environmentally sound agriculture to reduce runoff into rivers, and in wastewater treatment to meet EU accession standards. A further major challenge includes development of institutions, governance arrangements and incentive policies for efficient and equitable water management in the transition from centrally planned to market economies. An additional challenge is that irrigation infrastructure was developed for large farms and is ill-adapted to the small farms that have emerged since land privatization.

In **Latin America and the Caribbean**, too, there are a wide variety of water resources challenges. First, many countries in the region are vulnerable to recurring natural disasters from floods and droughts. Second, water quality management, and the associated unmet demand for urban environmental infrastructure, are a major challenge facing all

urban areas. Third, development of renewable hydropower is an important opportunity, with only about 20 percent of the economically viable potential currently tapped. Fourth, inland navigation is growing rapidly and plays a vital economic development role in the interior of the continent, but with major environmental implications. Fifth, protection of inland and estuarine freshwater ecosystems is an important challenge. Sixth, the development of major water infrastructure is quite uneven across the continent. In recent decades there have been some major advances in the use of innovative instruments for managing water, such as river basin authorities, stakeholder participation and water rights. In the advanced areas of the region there is a need for consolidation and refinement of these and other innovative instruments; in much of the region that process is yet to start.

The **Middle East and North Africa Region** has the highest level of water stress. Of overriding importance are technical innovation and more efficient allocation and use of surface water and groundwater. The challenges of re-use of water, desalination, irrigation modernization and orderly mechanisms for the voluntary transfer of water from low-value uses (especially agriculture, which uses 85 percent of the water) to high-value uses (especially urban and industrial) are of high priority. Increasing the level of wastewater treatment (from the current 27 percent) and re-use is a central, and expensive, challenge. While the primary focus in the region is on better management, there are major infrastructure challenges, too, often with an international waters dimension and often with major political, environmental, cultural property, economic, institutional and financial implications. Addressing the water challenges of the region will require detailed assessment of the long-term options facing both low- and middle-income countries, including desalination, waste water treatment and groundwater management. And it will require helping countries in the region enhance research to find innovative solutions.

The **South Asia Region** is, in many ways, a textbook case for the impacts, positive and negative, of water on growth, poverty reduc-

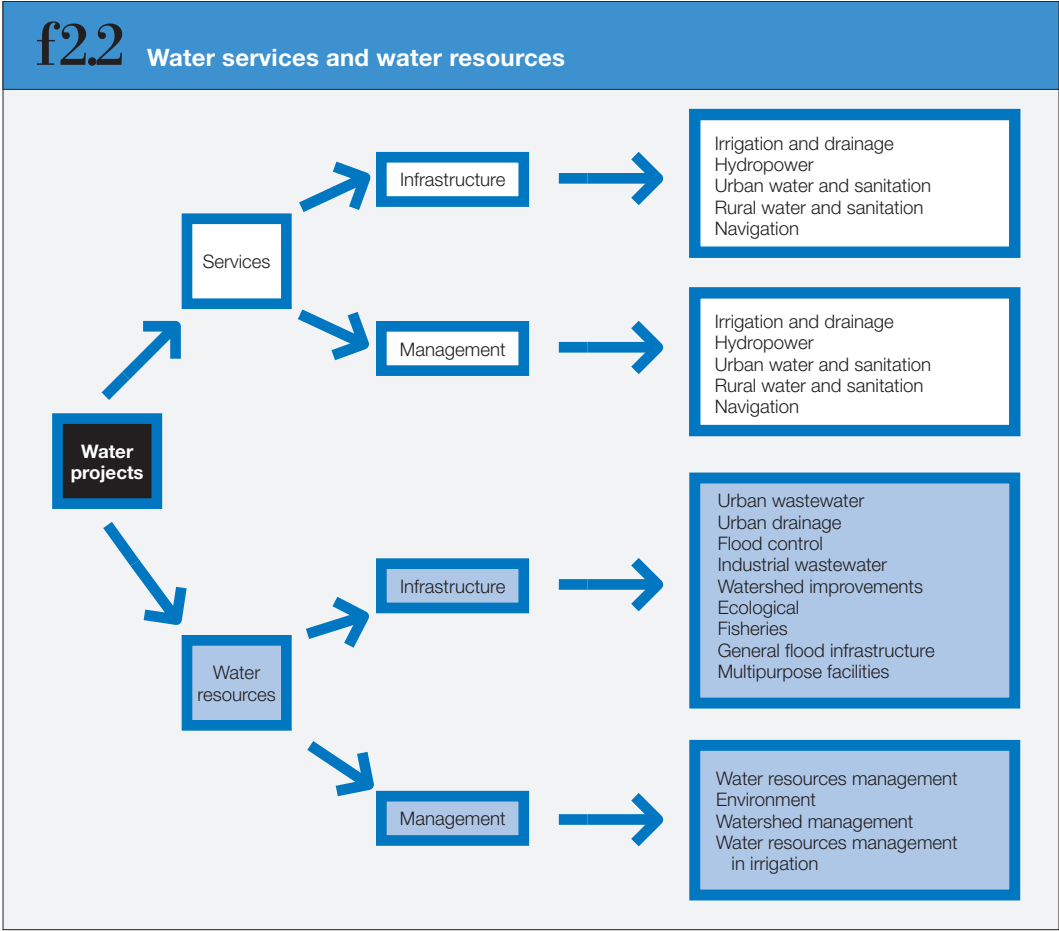
tion and sustainability. Major public investments were made in both colonial and independence eras in water storage, transmission, management and use. As documented earlier in this Strategy, these investments had huge, mostly positive, impacts on poverty, through direct effects on industry and agriculture and indirect effects operating through the multitude of linkages of energy and agricultural production with the development of local commerce and industry, and even with the economic returns of investments in human capital. Over time, however, serious challenges emerged. The adverse effects of large water projects on some groups of people were not adequately taken into account, nor was the evidence of declining performance and rising environmental problems (especially salinization).

Compounding these problems has been a regionwide lack of reform of the fundamental underlying water-use sectors (electricity, irrigation and water supply). A number of

governments in the region have embarked on major reform programs in these sectors. While commitment to reform is necessarily mixed in such a large region, and progress (for such complex issues) necessarily slow, the direction is clear. The World Bank supports such reform processes and has directed resources to governments making such reforms. As these reforms advance, and as illustrated in the Andhra Pradesh example below, the South Asia Region will focus on simultaneously supporting such reform processes and financing appropriate investments in infrastructure. As in other settings, progress will require principled pragmatism. The World Bank will act as a partner in supporting realistic, prioritized and sequenced locally driven reform packages and in supporting appropriate infrastructure investments, which are an essential complement to such reforms.

The overall picture, then, is one of enormous diversity and one that defies a standard,

The Middle East and North Africa Region has the highest level of water stress



prescriptive approach to determining actions and priorities. This means that there is a need for customized, localized analytic work in each region, country and subnational entity to identify the priority, mix and sequence of needed management and infrastructural actions.

World Bank engagement in water resources development and management

Developing countries invest about \$70 billion annually in water-related investments. About 90 percent of investment comes from domestic sources. The World Bank has historically invested about \$3 billion a year in water-related sectors, accounting for about 5 percent of investment in developing countries.

The level and composition of water resource-related lending Bankwide and in the regions

For this strategy, all World Bank-financed water projects in the past decade were reviewed and costs allocated to the specific items shown in figure 2.2.⁹ Anticipated lending for projects with water resources components and for the components themselves was estimated for the projects in the lending pipeline for 2003–05.

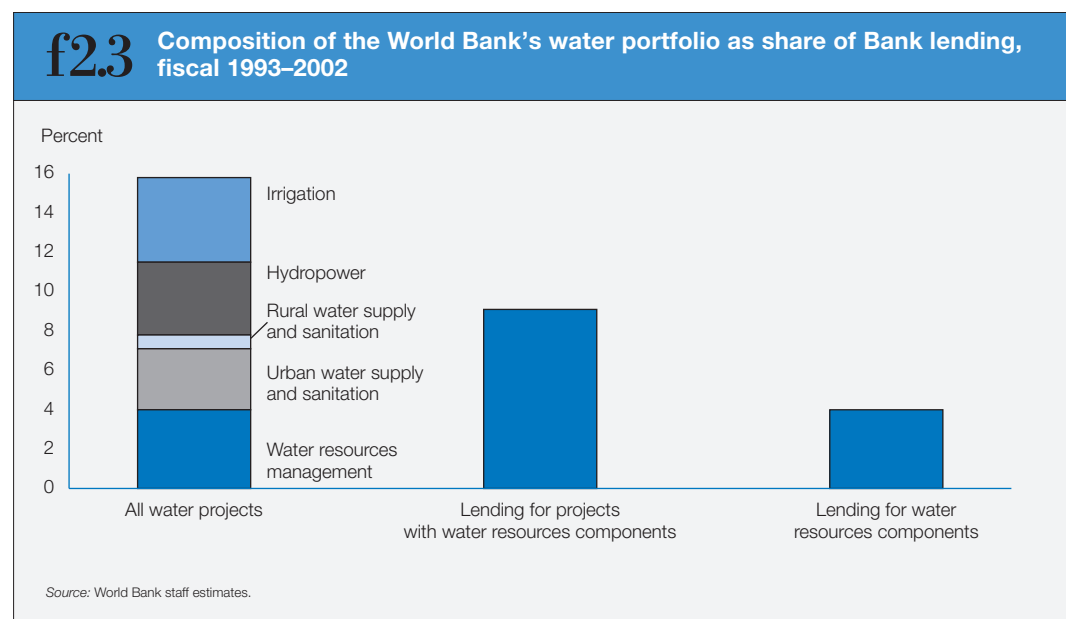
The results, in brief:

- Lending for water accounted for about 16 percent of World Bank lending over the decade (figures 2.3 and 2.4).
- The major water services components (irrigation, hydropower, and water supply and sanitation) each accounted for about 4 percent of overall World Bank lending over the period (figures 2.3 and 2.4).
- Lending for projects with substantial water resources management components accounted for about 9 percent of World Bank lending (figures 2.3 and 2.5).¹⁰
- Lending for water resources components accounted for about 4 percent of Bank lending (figures 2.3 and 2.6).
- As documented by the Operations Evaluation Department, in recent years there has been a shift away from traditional infrastructure sectors toward investments in the environment and resource management.¹¹

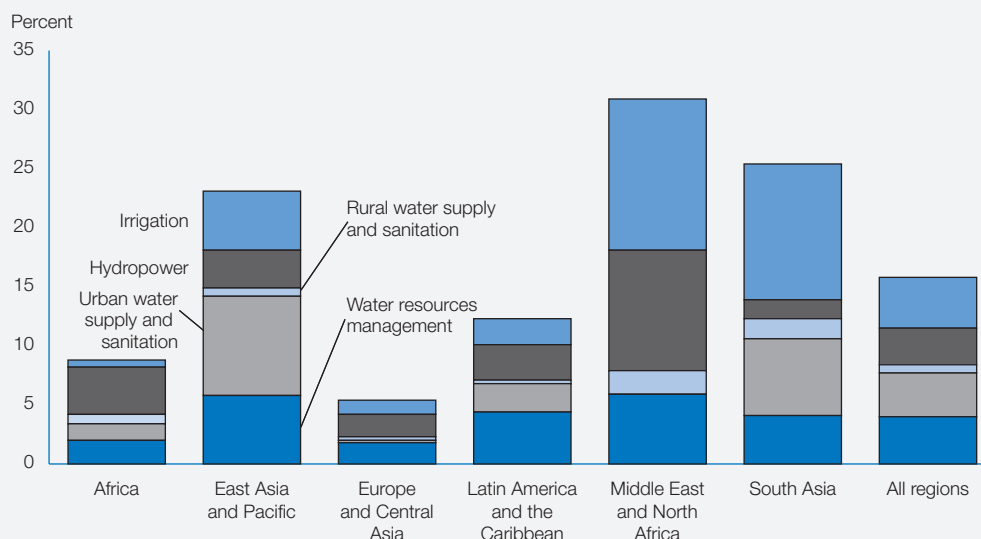
There are wide regional variations in current and anticipated levels and patterns of lending for water-related projects (figure 2.4), for projects with water resources components (figure 2.5) and for water resources components themselves (figure 2.6). In broad outline:

- **Africa**
 - Lending for water-related projects accounts for only 8 percent of Bank lend-

The World Bank has historically invested about \$3 billion a year in water-related sectors, accounting for about 5 percent of investment in developing countries



f2.4 Regional composition of water resources lending as share of total regional lending, fiscal 1993–2002



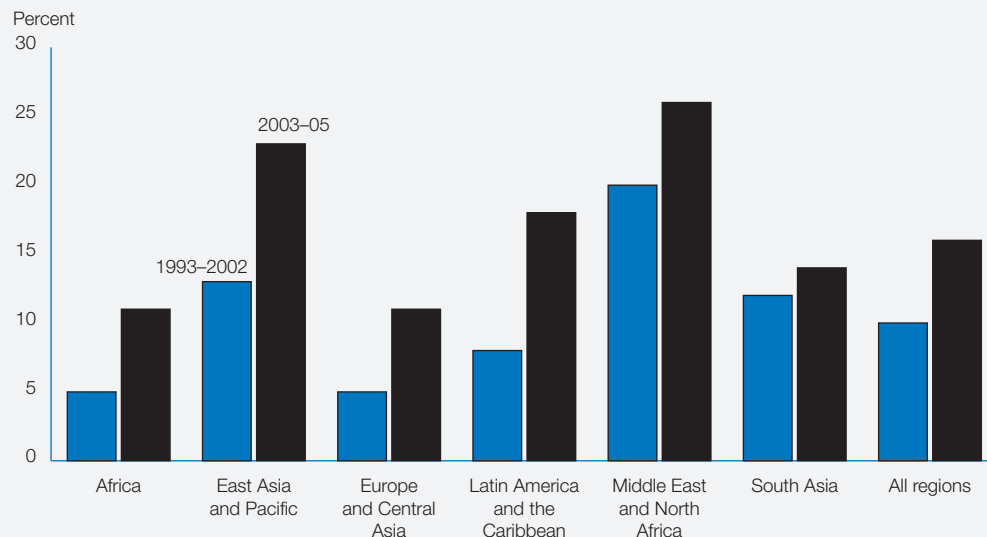
Source: World Bank staff estimates.

Lending for water accounted for about 16 percent of World Bank lending over the past decade

ing in the region over the last decade, compared with 16 percent Bankwide (figure 2.4). Most of this lending is for urban water supply and sanitation projects.

- Lending for projects with substantial water resources components is projected to rise rapidly, from 5 percent over the last decade to 11 percent in 2003–05 (figure 2.5), in considerable part due to the large investments the Africa Region has made in analytic and advisory work on water.
- Lending for water resources components will rise from 2 percent (portfolio) to 3.5 percent in the pipeline (figure 2.6).
- **East Asia and Pacific**
 - Lending for water-related projects accounts for 22 percent of Bank lending compared with 16 percent Bankwide over the last decade (figure 2.4). The region has had the largest hydropower program, sizable irrigation and water resources programs and modest lending for urban water supply.
 - Lending for projects with substantial water resources components is expected to rise rapidly, from 13 percent over the last decade to 23 percent in 2003–05 (figure 2.5).
- **Europe and Central Asia**
 - The region has the smallest portfolio (relative to overall regional lending) of water-related lending (figure 2.4). Lending for water-related projects accounts for only 5 percent of Bank lending in the region over the last decade, compared with 16 percent Bankwide.
 - Lending for projects with substantial water resources components is expected to rise rapidly, from 4 percent over the last decade, to 11 percent in 2003–05 (figure 2.5).
 - Lending for water resources components will stay about constant, at a low 2 percent (figure 2.6).
- **Latin America and the Caribbean**
 - Lending for water-related projects accounts for about 12 percent of Bank lending in the region over the last decade, compared with 16 percent Bankwide (figure 2.4). The region has a balanced portfolio of water resources,

f2.5 Lending for projects with water resources components, as share of total regional lending, fiscal 1993–2002 and 2003–05



Source: World Bank staff estimates.

Lending specifically for water resources components accounted for about 4 percent of Bank lending

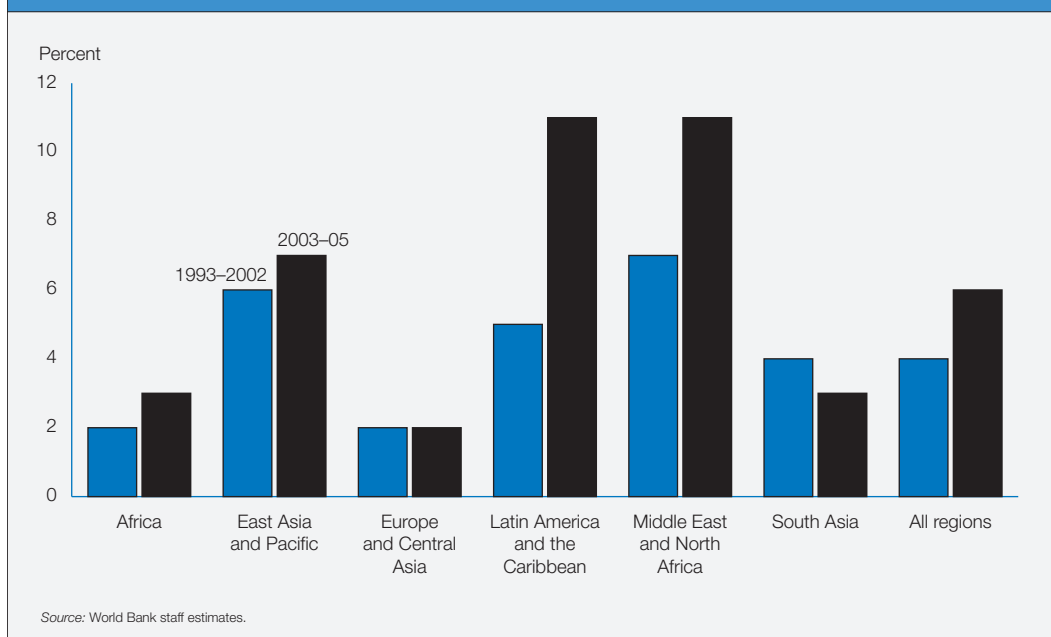
hydropower, urban water supply and irrigation lending.

- Lending for projects with substantial water resources components is projected to rise rapidly from 8 percent over the last decade, to 18 percent in 2003–05 (figure 2.5).
- Lending for water resources components is projected to rise from 4 percent (portfolio) to more than 11 percent in the pipeline (figure 2.6), giving the region the highest share of its lending to water resources components.
- **Middle East and North Africa**
 - As the driest region the Middle East and North Africa has the largest (as a proportion of regional lending) water portfolio in the Bank (figure 2.4). Lending for water-related projects accounts for 31 percent of Bank lending in the region over the last decade, compared with 16 percent Bankwide. The Region has substantial portfolios of irrigation, urban water supply and water resources lending.
 - Lending for projects with substantial water resources components is projected to rise still further, from 17 per-
- cent over the last decade to 26 percent in 2003–05 (figure 2.5).
- Lending for water resources components will rise from 6 percent (portfolio) to 11 percent in the pipeline (figure 2.6).
- **South Asia**
 - Lending for water-related projects accounts for 25 percent of Bank lending in the region over the last decade, compared with 16 percent Bankwide (figure 2.4). The South Asia portfolio is dominated by large irrigation projects.
 - Lending for projects with substantial water resources components is projected to rise slightly from 12 percent to 14 percent over the next three years (figure 2.5), while lending for water resources components is projected to decline from 4 percent to 3 percent of regional lending (figure 2.6).

The changing composition of World Bank lending for water resources infrastructure in the regions

Figure 2.7 shows the composition of water resources lending in the portfolio and the pipeline, for the World Bank and for each re-

f2.6 Lending for water resources components, as share of total regional lending, fiscal 1993–2002 and 2003–05



gion. Once again, the patterns are quite diverse, mostly related to the different challenges each region faces.

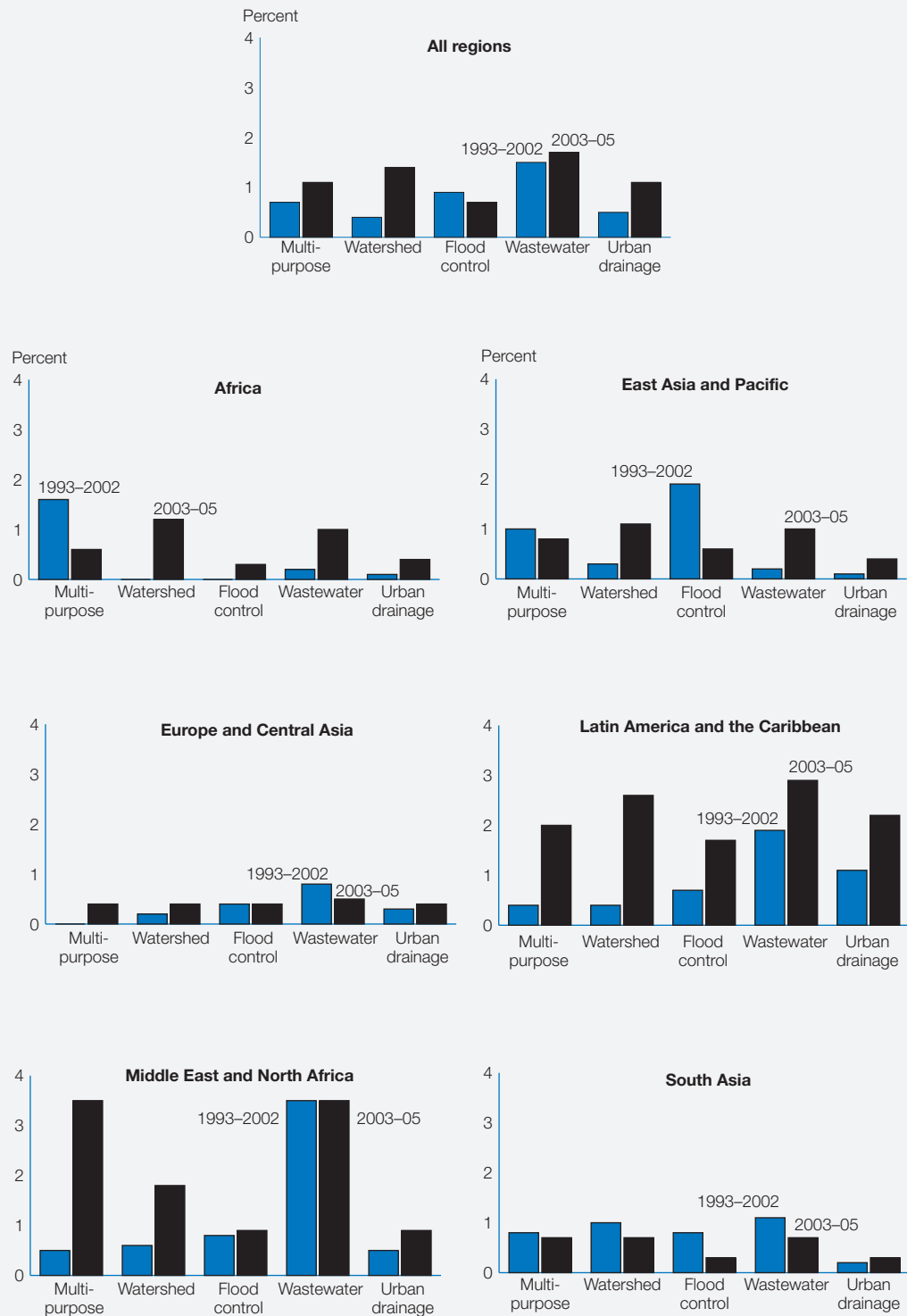
Overall, there have been large increases in Bankwide financing for water resources components of projects. Especially noteworthy are large increases in watershed management and urban drainage. Noteworthy trends in the regions include:

- Latin America and the Caribbean and the Middle East and North Africa Regions, the two regions with by far the highest investments in water resources management, invest heavily in wastewater treatment. The huge overall proportional increases in these regions are driven by large increases in multipurpose, watershed and urban drainage components of projects.
- Africa is also expanding rapidly from a low base and moving toward a diverse portfolio of water resources activities.
- Water resources activities in Europe and Central Asia remain very low but are expanding gradually. Lending constraints in the region are tight, and in the first years of transition the Bank's emphasis has been on economic reform and social protection rather than on investments in infrastructure. Extensive sector work is ongoing.

- Although South Asia has a large portfolio of water-related projects, the levels of lending for water resources components in the region is low and projected to decline.

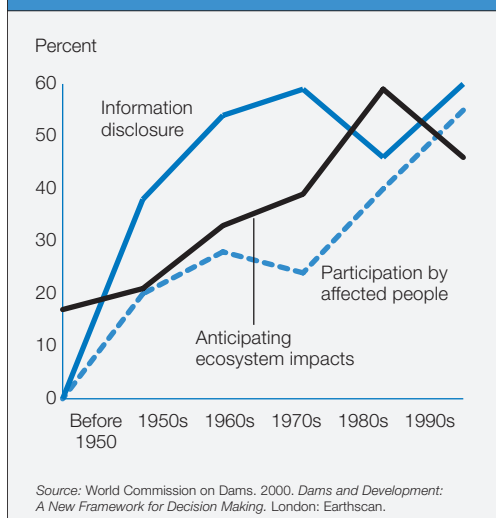
As documented by the report of the World Commission on Dams, the World Bank has become a global leader in integrating social and environmental considerations into water development and management and has contributed to the steady improvements in practice (figure 2.8) that have taken place in developing countries.¹² This has meant changes in what is done (with large increases in projects dealing with watershed management, for example) and how. Offsetting these positive changes, World Bank involvement in potentially controversial hydraulic infrastructure financing (such as dykes, dams, major canals and interbasin water transfers) has declined sharply. For example, whereas the World Bank financed 3.5 percent of dams constructed in the 1970s, it financed less than 1 percent in the 1990s, with World Bank lending accounting for less than 0.5 percent of total financing for new dams in developing countries. And Bank investments in hydropower declined by 90 percent over the last decade.

f2.7 Changing levels and composition of Bank investments in water resources, as share of total regional investments, fiscal 1993–2002 and 2003–05



Source: World Bank staff estimates.

f2.8 The social and environmental quality of the design of large dams



The IFC has 6 investments (with total commitments of about \$500 million for IFC’s own account and the account of participants) in water and sanitation and 10 in hydropower (also totaling about \$500 million in commitments for IFC and participants). Currently, MIGA provides political risk insurance to one water and sanitation project and four hydropower projects. Although business as usual scenarios suggest that hydropower would remain a relatively small portion of IFC and MIGA business, they may be called to play an enhanced role in ensuring that the private sector remains engaged in the development of water infrastructure in emerging markets.

The great challenge is making progress, not achieving perfection

The OED study of implementation of the 1993 Policy Paper found that the volume of World Bank lending for water has increased since 1993 and that the composition of the portfolio has changed considerably, with less spending on sectoral infrastructure, and greater attention to water resources management and environmental and institutional aspects. It also found that consistency with the Policy Paper has improved, with more sustainability, better institutional arrangements and some progress on water as an economic

resource. The study’s major lesson, however, is that “translating policies into practice is difficult.”¹³ More specifically, the study’s major conclusions include:

- *Selectivity and sequencing are important:* “Such a large task cannot be accomplished everywhere at once—or quickly. Selectivity is therefore important.... it is important to focus on doing a few things right to demonstrate new approaches that work. So, while it is necessary to be comprehensive, it is not necessary to be complex.... the agenda is extremely ambitious, and agreeing on the sequence and scope of activities in a country setting is difficult, time-consuming, and risky.”
- *Progress takes place more through “unbalanced” development than comprehensive planning approaches:* “Institutional development efforts should abandon comprehensiveness of scope and schedule and a partial, cumulative, and highly focused approach [should be] pursued....”
- *Triggers for reform usually come from outside the water sector:* “In all cases the precursors to water reform were outside the water sector—and reform of water is typically second or third generation, following in many cases reform of the power sector....In many of these cases water reform also benefited from the synergy of political and economic liberalization.”

There is some concern that this sequenced and prioritized approach means abandoning the idea of integrated water resources management, which was a core principle of the 1993 Policy Paper. This is not the idea. As noted earlier, even the world’s most developed countries are a long way from integrated water resources management, and progress has been slow and incremental. The goal of this Strategy is not to dismiss the goal of integrated water management, but to define practical, implementable and therefore sequenced and prioritized actions that can lead to that end.

The World Bank position on the “Guidelines” of the World Commission on Dams

As is evident in many places in this Strategy, the report of the World Commission on

The goal of this Strategy is not to dismiss the goal of integrated water management, but to define practical, implementable and therefore sequenced and prioritized actions that can lead to that end

The World Bank is committed to support its borrowers in developing and managing priority hydraulic infrastructure in an environmentally and socially sustainable manner

Dams issued in late 2000 is a major reference point in the ongoing debate about dams and their role in development. The main thrust of the report is advocacy of:

- Five core values—equity, efficiency, participation, sustainability and accountability—for future decisionmaking on dams.
- Seven strategic priorities—gaining public acceptance, assessing options, addressing existing dams, sustaining rivers and livelihoods, recognizing entitlements and sharing benefits, ensuring compliance, and sharing rivers for peace, development and security.
- A set of criteria for assessing compliance and 26 guidelines for review and approval of projects at five stages of decisionmaking.

Most organizations involved in the debate concur with the five core values and seven strategic priorities. However, in the two years since the report was issued, no consensus has emerged on the applicability of the 26 guidelines.

The World Bank conducted a detailed comparison of the 26 guidelines and the Bank's safeguard policies (see Annex 1).¹⁴ Although there is much in common, there are several important differences. First, while there is agreement on the importance of the rights of affected and indigenous people, the World Bank believes that adoption of the World Commission of Dams principle of "prior informed consent" amounts to a veto right that would undermine the fundamental right of the state to make decisions in the best interests of the community as a whole. Second, while there is agreement on stimulating good faith negotiations on international rivers, World Bank experience and policies are based on proactive engagement rather than disengagement from countries that are not already negotiating with their neighbors on international waters, as advocated by the World Commission of Dams. And, third, while there is agreement on the importance of consultation and public acceptance, experience suggests that the multistage, negotiated approach to project preparation recommended by the World Commission of Dams is not practical and would virtually preclude the construction of any dam.

The World Bank is committed to support its borrowers in developing and managing priority hydraulic infrastructure in an environmentally and socially sustainable manner. In doing this the Bank believes that the World Commission of Dams' core values and strategic priorities are appropriate principles and consistent with Bank practice and policies. The Bank will not, however, comply with the 26 guidelines. Rather, it will continue to work with its borrowers in effective implementation of current World Bank operational policies, which the World Commission of Dams describes as "the most sophisticated set of policies, operational procedures and guidelines amongst the international donor community."

A United Nations Environmental Program-led follow-up process (in which the World Bank is participating) is proceeding on a basis similar to that articulated by the World Bank: acceptance by all stakeholders of the core values and strategic priorities but recognizing that there is no consensus among stakeholders on the 26 guidelines.¹⁵

The comparative advantage of the World Bank and the need to revise business practices

The World Bank's role in water resources management has been discussed extensively with borrowers and other stakeholders in 14 formal and multiple informal consultations. There is much commonality in the views expressed, the most important of which include:

- Improved water development and management are *essential for sustainable growth and poverty reduction* in many developing countries.
- *The World Bank has played a major role* in improving technical, financial, social and environmental performance of water management.
- Borrowers find that the World Bank has a *strong comparative advantage* in convening power, ability to link water issues to other sectors through economywide engagement, a multidisciplinary perspective, relations with almost all riparian countries, a combination of knowledge and finan-

cial resources, and engagement at all scales (local watershed, city, irrigation district, river basin and aquifer, country, regional) and ability to integrate across these.

- The World Bank, both directly and through its role in the Global Environment Facility, has a major role to play in facilitating cooperation on *international waters* and in helping finance priority investments resulting from cooperative management. The basis for success must be a focus on sharing benefits, not on sharing water. Recent work has shown that such an emphasis can bring benefits “to the river” (enhanced environmental quality), “from the river” (economic benefits), reducing costs “because of the river” (conflicts among riparians that are exacerbated by conflicts over water) and “beyond the river” (broader economic cooperation among riparians).¹⁶
- There is a strong appreciation for the scope of the World Bank Group’s instruments to assist borrowers in the area of private sector participation in infrastructure. There are a number of instances in the water sector of successful *collaboration between the World Bank and IFC*.
- An important and growing area of World Bank involvement is in *increasing the benefits of existing hydraulic infrastructure* and in the associated challenge of rehabilitating and maintaining infrastructure stocks.
- Borrowers have a *strong desire that the World Bank remain involved*, especially in the most challenging and contentious issues.
- There is a broad recognition that *neither infrastructure alone nor management reforms alone are adequate*, and a general recognition that it is integrated packages of software and hardware that are needed in most developing countries. It is essential that a least-cost mix of infrastructure and management approaches be used to achieve development objectives.
- In all cases, the Bank must emphasize the importance of institutions and *capacity building* from the national to the local level.
- Borrowers expressed *concern with the increasing complexity, cost and rigidity of the World Bank’s business processes*, and its in-

ability to come to closure on controversial projects.

- Because of the high transactions costs and what some describe as the risk-averse approach of the World Bank, borrowers increasingly see the World Bank as *a less preferred source of financing* (compared with domestic sources, commercial lenders, bilateral donors and other multilateral development banks).
- The reduced Bank engagement with major infrastructure has *lessened the Bank’s ability to influence critical legal, institutional and regulatory reforms*.
- The Bank must be engaged in a full range of infrastructure and management activities in “countries that have investment choices” if the Bank is to remain a *credible knowledge institution*, since it is often experience in these countries that is relevant to poorer countries.

These realities pose a formidable challenge for the World Bank, in basing advice on sound, objective analysis; in being realistic; in taking advantage of opportunities that arise; and in working with its borrowers to identify a set of prioritized, realizable management and infrastructure investments that can help make steady improvements through an evolving, long-term approach.

Notes

1. World Bank. 2001. “Responding to the WCD Report: A Progress Report from the World Bank.” [www.worldbank.org/water, section on dams and the World Commission on Dams].
2. See www.worldbank.org/water under “Sector Strategy.”
3. See www.worldbank.org/water under “Sector Strategy.”
4. World Water Commission. 2000. *A Water Secure World: Vision for Water, Life and the Environment*. Marseille: World Water Council.
5. World Commission on Dams. 2000. *Dams and Development: A New Framework for Decision Making*. London: Earthscan.
6. World Bank. 1993. *Water Resources Management: A World Bank Policy Paper*. Washington D.C.
7. World Bank Operations Evaluation Department. 2002. *Bridging Troubled Waters: Assessing the World Bank Water Resources Strategy*. Washington D.C.

Because of the high transactions costs and what some describe as the risk-averse approach of the World Bank, borrowers increasingly see the World Bank as a less preferred source of financing

8. Organisation for Economic Co-operation and Development. 1998. *Water Management: Performance and Challenges in OECD Countries*. Paris.
9. The data in this section are based on unpublished analysis done by World Bank staff for this Strategy.
10. A project is defined as having “substantial water resources components” when more than 30% of project cost is allocated to water resource infrastructure and management, as defined in figure 2.2.
11. World Bank Operations Evaluation Department. 2002. *Bridging Troubled Waters: Assessing the World Bank Water Resources Strategy*. Washington D.C.
12. World Commission on Dams. 2000. *Dams and Development: A New Framework for Decision Making*. London: Earthscan.
13. World Bank Operations Evaluation Department. 2002. *Bridging Troubled Waters: Assessing the World Bank Water Resources Strategy*. Washington D.C.
14. World Bank. 2001. “Responding to the WCD Report: A Progress Report from the World Bank.” [www.worldbank.org/water, section on dams and WCD].
15. www.unep-dams.org.
16. Sadoff, C., D. Whittington and D. Grey. 2002. *Africa's International Rivers: An Economic Perspective*. Directions in Development Series. Washington D.C.: World Bank.

3. STRATEGIC OPTIONS AND POSSIBLE BUSINESS IMPLICATIONS

The additionality and focus of this Strategy

Two distinct classes of challenges need to be faced if the World Bank is to be an effective partner. Class 1 challenges relate to the many areas of water resources management where there is broad consensus, where Bank practices have changed for the better and where the need is for “more of the same.” Class 2 challenges relate to a few fundamental areas where there is no global consensus, where the Bank has not charted a consistent set of rules of engagement and where, as a result, the Bank has not performed as well as it could as a reliable and effective partner.

Class 1 challenges are numerous. They include more attention to water quality, conservation, groundwater management, watershed management and small-scale, community-based solutions, and institutional reform. As documented earlier and in the Operations Evaluation Department report, the World Bank has invested heavily in these vital areas over the past decade and will continue to increase such lending.¹ Precisely because there is momentum and no particular barriers to Bank engagement with these issues, no major changes of course are required, and there is no need for Bank management and the Board to focus specifically on them. These issues—which are very important and constitute the majority of activities with which the Bank is involved—are thus treated only briefly in this Strategy. Instead the Strategy focuses on the difficult and contentious class 2 challenges that require the attention and guidance of senior management and the Board.

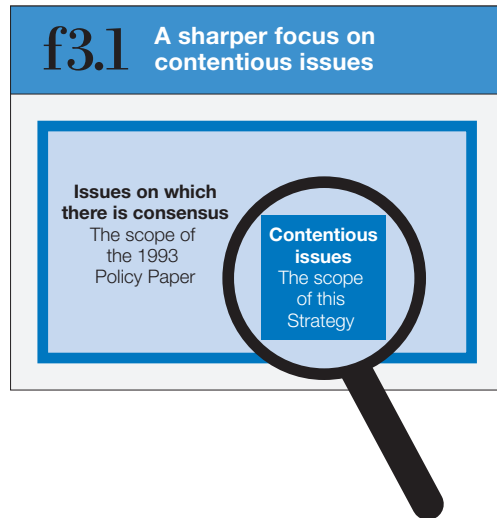
Because it is easy to misinterpret this Strategy (by incorrectly assuming that the amount

of attention devoted to a particular issue implies how important an issue is judged to be), the approach is illustrated schematically. Figure 3.1 shows that this Strategy applies a magnifying glass primarily to the contentious and difficult issues, giving less attention to the more numerous (and very important) issues that progress naturally, with few impediments. Chapter 4 shows how the Strategy (and the 1993 Water Resources Management Policy Paper) might play out in different country contexts, showing in most cases that it will be a mix of management and development investments that need to be undertaken.

The objective of this Strategy is to position the World Bank as an effective partner for countries as they seek to develop and manage their water resources to stimulate sustainable economic growth and poverty reduction. The Strategy builds on the following assessment:

- In all countries there is a major need for more effective management of water resources, to ensure increased benefits across sectors while taking into account the diverse interests of stakeholders (including poor people).
- In all countries there is need for greater attention to water allocation, demand management, water rights and the use of pricing and other economic instruments.
- In all countries there is a need for improving the benefits from existing infrastructure and for developing institutional and financial arrangements for sustainable rehabilitation and maintenance.
- In many developing countries appropriate management and institutional actions need to be complemented by investments in a range of new hydraulic infrastructure.

This Strategy applies a magnifying glass primarily to the contentious and difficult issues, giving less attention to the more numerous issues that progress naturally, with few impediments.



Continued engagement by the World Bank Group can only take place in the context of a transparent and candid assessment of risks and the management of these risks through a diversity of instruments and oversight

These investments require long-term financing, and financing requirements will only continue to grow as costs increase. Effective support will require deployment of the full range of instruments available through the World Bank Group (including IFC and MIGA).

- As demands for water services rise, increases in supply will require the use of next-generation technologies, including demand management, interbasin transfers and the sharing of benefits from transboundary waters. Together, these result in significant increases in the financial and transaction costs of delivery.
- Potential returns to packages of management and infrastructure investments are large. In many countries investments in water resources management infrastructure can have high direct and indirect economic growth and development payoffs (including mitigation of climate change impacts on the poorest, and conflict prevention). There are risks, but there are also high returns.
- Sound water resources management is a significant public good (flood control, interbasin and transboundary issues) and is part of an effective strategy for poverty reduction (employment generation, health and livelihood enhancement).
- Continued engagement by the World Bank Group can only take place in the context of a transparent and candid assessment of risks (of both engagement and nonengagement) and the management of these risks through a diversity of instruments and oversight.

Many of these issues are complex, contentious and longstanding. It is not realistic to expect that this Water Resources Sector Strategy will bring quick and final closure to all, or even most, of these issues. The Strategy is thus not a detailed business plan. Rather it focuses on major strategic challenges in positioning the World Bank to be an effective “full service” partner to its borrowers.

Developing a portfolio of analytic work that informs management decisions and recognizes differences

While there are many common challenges facing all countries, there is also a high degree of specificity in water resources development and management. Accordingly, global lessons of experience have to be crafted into realistic and appropriate country and sometimes regional goals and strategies, depending on cultural, historical, political, economic and natural conditions. Economic and sector work is critical for this adaptation process. The Operations Evaluation Department report documents an encouraging increase in the quantity of water-related analytic work and a shift in such work toward the key management challenges.²

An important area for deepening the World Bank’s portfolio of economic and sector work, as pointed out by the Bank’s Quality Assurance Group, is in more explicitly linking analytic work, which focuses on the challenges to the country, to World Bank activities—both “upward” to the Country Assistance Strategies and Poverty Reduction Strategy Papers, and “downward” to investments. As part of the process of preparing this Strategy, each region has initiated (with seed funding from the Global Public Goods fund) a Country Water Resource Assistance Strategy for one priority country in the region. These will not usually involve new analytic work and will generally be short, action-oriented papers. They will be a mechanism for focusing the attention of the country team on water resources issues, for engaging regional and global water knowledge in the World Bank and for reaching agreement with clients. A

central element of the Country Water Resource Assistance Strategy will be the political economy of change in water resources management—identifying potential triggers and defining how to be selective and how to allocate World Bank resources where there are windows of opportunity. Country Water Resource Assistance Strategies will eventually be prepared for many of the Bank’s borrowing countries.

Working with partners

As described by the Operations Evaluation Department report, “creating a shared vision among the World Bank, borrowers, and other development partners is the key to successful implementation of the World Bank’s water strategy.... and the World Bank has some major accomplishments” both at the global and regional level. However, “a major concern is the inability to meet the cost of proliferating partnerships.”³

With the exception of first-hand access to global best practice, the regional development banks share most of the World Bank’s comparative advantages. Accordingly, an emerging pattern in some countries is for close cooperation in knowledge sharing and finance between the World Bank and the regional banks. Bilateral agencies typically do not have the same global mandate or sectoral spread.

Partnerships that make things happen on the ground are already under way, not least at the regional level, where the Africa Region⁴ and Middle East and North Africa Region,⁵ for example, have developed effective operationally oriented regional water resources partnerships. The logical corollary is that the World Bank will give priority to action-oriented partnerships—such as the Global Water Partnership,⁶ which stimulates action-oriented partnerships in regions and countries for better water management—and largely disengage from partnerships that do not directly lead to action on the ground.

Of particular importance is the development of a new set of bilateral partnerships for stimulating cutting edge action in World Bank

water resources projects. The World Bank Netherlands Water Partnership Program provides a useful model.⁷ Under this program the World Bank’s Water Resources Management Group has identified a series of cutting edge issues (including poverty and livelihoods in water projects, international waters, watershed management, irrigation reform, wastewater management, water rights, river basin management, groundwater, ecological flows and flood management). For each issue a team of experts with field experience is assembled. World Bank operations have easy access to the services of these experts, who help incorporate these issues into World Bank operations and help disseminate lessons.

Finding new sources of financing for water resources infrastructure

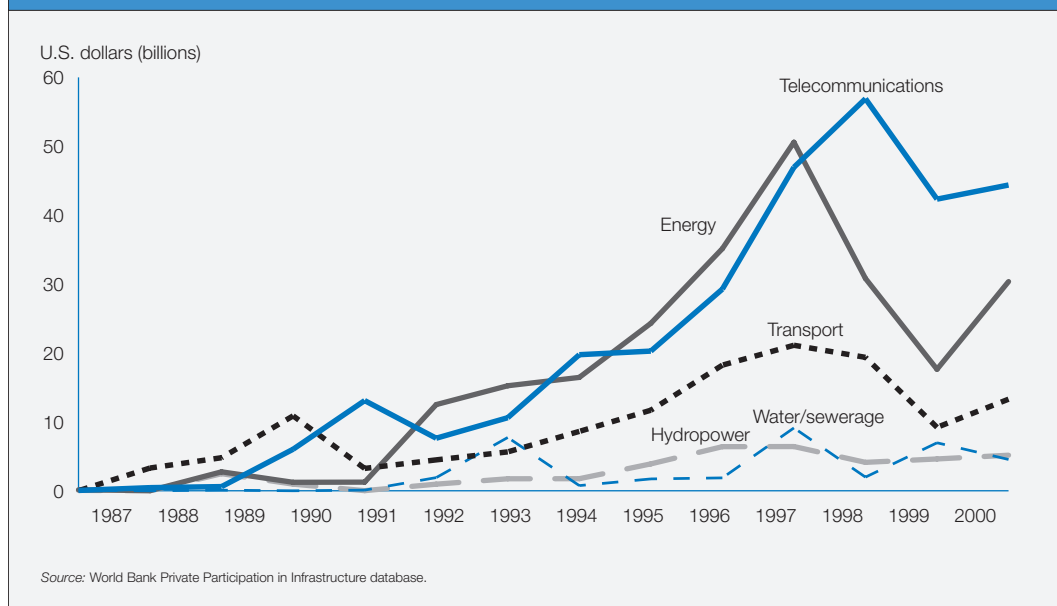
Numerous assessments have documented the huge financing needs for water-related infrastructure in developing countries. The World Commission on Water estimates that investment needs to increase from the current level of about \$70 billion a year (\$17 billion for hydropower, \$28 billion for water and sanitation and \$25 billion for irrigation⁸) to \$180 billion a year to ensure water security by 2025.⁹ There is now broad consensus among developing countries that while public funds have been and will remain dominant and indispensable, the required infrastructure cannot be built with public funds alone and that the private sector has an important complementary role to play in financing water resources infrastructure. The Monterrey Conference on Financing for Development, for example, highlights “a need for the relevant international and regional institutions to increase their support for private foreign investment in infrastructure....”¹⁰

Over the 1990s there has been a major change in the role of the private sector in financing infrastructure, including water-related infrastructure, in developing countries.¹¹ Starting from a very low base, the private sector has invested about \$700 billion in infrastructure in developing countries over the past decade (figure 3.2).

A closer look at the data shows that there are significant challenges to be faced if the private

There is now broad consensus among developing countries that the required infrastructure cannot be built with public funds alone and that the private sector has an important complementary role to play

f3.2 Private investment in infrastructure, 1987–2000



Over the past decade there has been a major change in the role of the private sector in financing infrastructure, including water-related infrastructure, in developing countries

sector is to play a major role in financing water infrastructure. First, while private investment in infrastructure rose dramatically during the 1990s, it had declined considerably by the end of the decade. In the current financial market environment of markedly reduced appetite for risk in emerging markets the late 1990's level of financing is unlikely to be reached again soon. Second, only a small proportion of private investment in infrastructure went into water-related infrastructure—about 5 percent into water and sanitation and another 5 percent into hydropower. Third, these investments were heavily concentrated in relatively low-risk economies in East Asia and Latin America.

Even within these favored environments, the outlook is sobering. A detailed assessment in Latin America, for example, shows that private investment (at 1998 levels) is sufficient to cover only 5 percent of water and sanitation and 20 percent of energy (including hydropower) investment needs. Worldwide, only about 5 percent of water services are currently provided through the private sector.

Private international financing is particularly important for small countries that do not have the capacity to raise funds from domestic public or private sources. To stimulate private

investment there is a need for a more collaborative public-private partnership, an approach in which the World Bank has a role to play. This approach will necessarily include:

- *Options assessment and project identification.* Private (and public) investments in dams and major conveyance infrastructure can only take place if the public sector has done the necessary upstream hydrologic, economic, environmental and social assessment of options.
- *Investing in public goods.* Multipurpose projects produce both private benefits (such as hydropower), which can be either privately or publicly financed, and public benefits (such as flood protection), which must be publicly financed. Engagement of the private sector in such projects requires partial public financing.
- *Assigning and managing risks through public-private partnerships.* Managing risk will involve assistance to the private sector in managing foreign exchange risk when long-term fixed rate local currency financing is not available and short-term financing does not match the economic life of the assets. And it will involve blending public and private sector funding to lower the overall cost of capital.
- *Legal and regulatory frameworks.* Only the public sector can develop a stable

enabling environment with effective and predictable rules and institutions for balancing the interactions of investors, government, and users and other affected people. For water projects this institutional capacity is needed at both the national and local government levels and is necessary for both private and autonomous public service providers.

- *Output-based aid.* Greater use should be made of output-based aid, with funds disbursed on the basis of actual services delivered.¹² This approach is now being implemented for wastewater treatment in Brazil, for example, by both public and private service providers.¹³

In stimulating these additional sources of financing, there are complementary roles to be played by all members of the World Bank Group in many of the World Bank's borrowing countries: for MIGA to provide political risk insurance, for IFC to participate as an investor in priority infrastructure and for IBRD and IDA to provide a combination of investments, guarantees and assistance in developing legal, regulatory and institutional arrangements. While cooperation among World Bank Group members has improved substantially in recent years, there is still more to be done. Because water reforms are never one-shot transactions, there is a particular need for the transaction-oriented IFC and the development-oriented Bank to fully cooperate on critical reform efforts. The involvement of IFC is particularly critical in low-income countries, where domestic and international commercial financing is often not available.

The second reason the private sector is important for water resources management is more subtle but no less relevant. Improved water resources management only happens when there are incentives for empowered actors to make things change. The Operations Evaluation Department review and the World Bank's consultations show that the insertion of the private sector (as operator of an urban water supply or a hydropower plant) provides a powerful incentive to change.¹⁴ The case of the water concession contracts in Manila provides a graphic illustration. Private operators have become a potent source of pressure to modernize the system of allocation and man-

agement of water rights, so that transfers can take place voluntarily and with compensation.¹⁵ Also, the concession holders have pushed for and invested in improved watershed management, recognizing that their investments depended on the quality of their bulk water.¹⁶ In a similar vein the World Commission for Dams report shows that most good practices in licensing and benefit sharing are associated with commercially operated infrastructure.¹⁷

In this regard, the World Bank Group is at a crossroads. While the World Bank has played a role in highlighting the benefits of private involvement, when it comes to controversial infrastructure, the World Bank is now often perceived (by both the private and public sector) as a costly and risk-averse partner.

In summary, the "gloomy arithmetic" of water is matched by the "gloomy financing" of water. The financial requirements of meeting the growing needs of growing populations are very large and far outstrip current levels of investment. It is essential to make the best use of every public and private dollar, to manage demand more effectively, and to develop bankable public and private projects that can attract additional financing.

Dealing with risk and developing a more effective business model

Risk lies at the heart of the development challenge. "Developing countries" is almost synonymous with "high risk"—for the people who live there and for those who might invest. A core *raison d'être* for the World Bank is to help reduce these risks, for local people and for investors. Consultations on drafts of this Strategy showed that there are widely differing views of how risk should affect what the World Bank does and how it does it.

Some believe that the engagement with risk must be defensive, governed by the precautionary principle (when an activity might harm human health or the environment, precautionary measures should be taken even if some cause and effect relationships are not fully established scientifically, so that the proponent of an activity bears the bur-

The "gloomy arithmetic" of water is matched by the "gloomy financing" of water

The issue of affirmative engagement with risk has emerged as a major challenge for the World Bank in water, forestry, mineral resources and other areas

den of proof).¹⁸ There is broad agreement that an essential part of good development practice is the assessment of risks, to different groups of people, and from both action and inaction. Most practitioners, however, believe that the application of the precautionary principle would be a recipe for paralysis, and that few development projects would ever be undertaken if such an approach to risk were taken.

The issue of affirmative engagement with risk has emerged as a major challenge for the World Bank in water, forestry, mineral resources and other areas. Consultations for this and other strategies have shown that there are strong concerns from governments, the private sector and many Bank staff that when development risks are high, and Bank engagement is particularly valuable and important, the Bank must ensure that it is a risk mitigator, not a risk multiplier. There is also a concern that the Bank has focused largely on errors of commission (risks of engagement) and paid less attention to the vital errors of omission (risks to people of nonengagement by the Bank).

Accordingly, an important part of the work done for this Strategy was the convening of a high-level World Bank Group-wide panel to articulate a vision for how the World Bank might actively engage with high-reward-high-risk investments. The task for the panel was explicitly not to dilute the World Bank's commitments to sound economic, social and environmental practice but to sketch a new business approach to ensure that the objectives of social and environmental safeguards would be met; that better quality projects would be the result; that decisions would be made in a clear, predictable and timely manner; and that risk aversion among staff would be reduced by providing more assurance of support from senior management. This section draws heavily and often directly on the report of the panel.

To date discussion of risk in the World Bank has been too narrowly and internally focused. The definition of risk for people in developing countries must start with the development risks of World Bank engagement or nonengagement.

It is possible to discern different patterns with middle-income and low-income countries. Middle-income countries express frustration at what they perceive as a rigid, rule-bound, risk-averse approach from the World Bank. They increasingly see the World Bank as the least-preferred source of funding (after domestic sources, private capital and other international financing institutions) because of the monetary, transaction and delay costs that are a part of dealing with the World Bank. But they often still express a strong desire to have the World Bank engaged in cutting edge, high-reward-high-risk water infrastructure because they believe that the World Bank has a unique comparative advantage in helping them deal appropriately with the range of economic, institutional, social and environmental challenges posed by such projects. Despite this wish to engage with the Bank, countries with choices are less and less engaged with the Bank in these areas.

Low-income countries have many of the same concerns as middle-income countries, but these poor countries do not have access to the other sources of financing that are available to middle-income countries and thus see no alternative to the World Bank, both as a direct source of financing and as the catalyst for resources from the private sector. They remain engaged with the Bank because they seldom can proceed without Bank engagement.

World Bank projects that include major water infrastructure can be classified by whether the World Bank was involved early or late and whether the borrower's and the developer's capacity was strong or weak. An examination of a cohort of projects comes to the following conclusions:

- That the best possible situation is when the World Bank is engaged from the early planning stages, and the project has a strong borrower and a strong developer.
- That such ideal conditions are, almost by definition, rarely encountered in the World Bank's borrowing countries.
- That, other things being equal, the distance between the ideal and the actual is least for the World Bank's better developed borrowers (who also have choices and are less and less engaged with the

World Bank on these issues) and greatest for the poorest borrowers.

- That practice (the World Bank's and the borrowers') has improved consistently and markedly in recent decades.
- That early engagement means that the World Bank can have a major influence on critical issues such as options assessment and environmental offsets.
- That late engagement means that the World Bank's focus is necessarily primarily on safeguards (with strong evidence that there can be a lot of added value from the World Bank's engagement even at that stage).
- That the World Bank needs to deal much more transparently and proactively with known and unknown risks.
- That third party oversight can be useful in specific cases.
- That a proactive cost-effective communications strategy with all stakeholders is essential.
- That disengagement by the World Bank is the result of a set of disincentives embedded in the World Bank's business practices.

An examination of the incentives that operate within the World Bank reveals the following:

- There is evidence (as manifested in the recent discussion on the cost of doing business) that the World Bank's clients perceive the World Bank to be walking away from areas that are reputationally risky to it, and perceive such behavior to be driven by internal disincentives for managers and staff to deal with such projects.
- There is powerful internal evidence of the reluctance of many managers to get engaged with such projects. There appear to be four related phenomena driving this disengagement:
 - The costs of preparing and supervising such projects are typically many times those incurred in preparing and supervising a normal World Bank project. The logical behavior for country directors faced with a budget constraint is to shy away from these high-cost projects.
 - There is a palpable down-side for managers (from vice presidents to country directors to task managers) who get engaged in such projects, and little up-side.

- The probability of such projects going to the Inspection Panel is rapidly approaching certainty.
- Senior managers find that these controversial projects occupy a large proportion of their management time.
- The result of this set of disincentives is predictable—the World Bank is less and less involved in complex, high-reward–high-risk water infrastructure (and similarly controversial projects in other areas).

An improved approach for World Bank involvement in high-reward–high-risk activities (including water management) might involve a two-step set of rules of engagement.

Step 1: How the World Bank should decide whether to be involved in a specific major water infrastructure project

The project should be relevant to the development objectives of the borrower and the World Bank:

- *Relevance to overall national development strategies as reflected in the Country Assistance Strategy.* This will always include poverty reduction, but it can and should also include broader strategic objectives. In the case of China, for example, this would include the evolution from a command to a market economy and from a rural to an urban society. And in the case of international water projects (such as the Nile Basin Initiative) the relevance to regional security and conflict prevention are of major importance.
- *Relevance to poverty reduction.* Water projects often contribute to poverty alleviation both directly (through resource management and services targeted to the poor) and indirectly (through better overall resource management and improved operation of service providers).
- *Relevance to development of the World Bank's comparative advantage.* Many best practices in the area of water infrastructure (such as for resettlement in China or for benefit sharing in Brazil) have been developed by the World Bank's more developed borrowers. If the World Bank is to be a credible knowledge partner it must

The World Bank will follow an improved approach for involvement in high-reward–high-risk activities

be engaged not only with the borrowers who have no other options but with its middle-income borrowers.

The risk profile must be assessed:

- *The development consequences of World Bank nonengagement*, which must include:
 - The possibility that the project, and its net development and poverty reduction benefits, will not be undertaken if the World Bank is not engaged.
 - The possibility that the project will be done anyway, but with lower net benefits without World Bank involvement.
- In both cases, standard methods for assessing the magnitude and distribution of costs and benefits (including economic, environmental and institutional) will be coupled with probabilistic assessments of likely outcomes to evaluate the “no-Bank-engagement” development outcome.
- *The risks to the World Bank* from engagement or nonengagement:
 - From the perspective of the borrower.
 - From the perspective of civil society in the borrowing country.
 - From the perspective of private developers.
 - From the perspective of public perception in developed countries and the related perceptions from NGOs.
- *The risk implications must be assessed (by impact and likelihood)*, as must the implications for managing them, monitoring and responding.
- *These risk implications must be considered* by regional and World Bankwide management, which views them in the context of other risky projects and the regional and World Bankwide appetite for risk.

Step 2: How the World Bank should manage major water infrastructure projects

These high-reward–high-risk projects are a special class of operations, with spillovers that go well beyond the country and the region:

- Perceptions (of borrowers, the private sector and NGOs) are global. For example, the World Bank’s performance on a hydropower project in Lao PDR is known

by the major global private actors and thus affects the Bank’s ability to attract private partners for similar projects in Uganda. The performance of an inter-basin transfer in East Asia has implications for World Bank engagement with borrowers in the Middle East and North Africa who have similar needs. And the repercussions of the World Bank’s performance on a dam in Argentina have an impact on the availability of IDA funding for Bangladesh.

- The projects involve dealing with common sets of environmental and social issues.
- The projects involve dealing with common sets of stakeholders, including the private sector, the media and NGOs.

Accordingly, these high-reward–high-risk projects will be treated as “corporate projects.” The key elements of such an approach are:

- *Accountability.* Regional vice presidents and country directors will be accountable for these projects. From an early stage these projects will be brought to the attention of senior management, who in support of the regions, will participate in decisions on whether the World Bank will engage and how risks will be managed.
- *Improved implementation of safeguards.* Good preparation, including adequate attention to environmental and social issues, involves higher short-term costs, but lower long-run costs. For these projects there will be an agreed-on corporate strategy for ensuring that the objectives of the safeguard and other operational policies are respected, while focusing attention and resources on safeguards that are material in particular circumstances.
- *Communication.* An essential element will be the development of a unified communication strategy for addressing head-on in an open manner the concerns of different stakeholders, including critics.
- *Resources.* While there will not be an automatic provision of special corporate resources to such projects, management will continue to use a common-sense approach to such projects, providing additional resources on a case-by-case basis

High-reward–high-risk projects will be treated as “corporate projects”

as the need arises during preparation and implementation.

- *Incentives for front-line staff.* Central to this approach is the necessity to reduce transactions costs and to change the incentives facing front-line staff. Task managers leading risky projects will not be left on their own, but will have consistent support from regional and corporate management and will get recognition for this difficult and vital work.

How the World Bank is organized and staffed for water resources management

Water resources management is not a sector but a set of cross-cutting legal, regulatory and operational activities. For this reason it does not fit—in countries or in the World Bank—easily into established ministries or sectors. This Strategy does not propose any fundamental organizational change in the World Bank, but rather a fine-tuning of existing institutional arrangements to ensure accountability and resources for making the necessary connections.

In the regions

There have been many ways in which the Regions have adjusted their accountability and staffing arrangements to deal with the growing challenge of water resources management. Two years ago there were regional water resources advisers (or their equivalents) in just three regions; today there are designated advisers in all regions.

The formal nomination of these regional advisers, and their appointment to represent the region on the Water Resources Management Group, has been a major step forward in improving the coordination of the Bank's work on water resources across the Bank and in the regions. Appropriately, given the widely varying challenges in the regions, accountability and organizational responses have varied substantially by region:

- In Africa the regional vice president and the Regional Management Team have given the regional water resources adviser a mandate to stimulate and direct the re-

gion's work on water resources and have assigned substantial regional resources for this work. The regional adviser and team (most of whom continue to work in their host departments) have a strong presence both at headquarters and on the ground in Africa, where the World Bank's leadership is widely acknowledged and respected. The growing portfolio of water resources lending in Africa is a direct response to this investment by the Africa Region.

- In the Middle East and North Africa the sector manager for water and environment in the rural department has functioned as the region's water adviser. This arrangement has worked well, providing high-level visibility for the Bank's water resources work in the region. The Regional Management Team sees the next step as working to integrate the Bank's water assistance to countries. An important mechanism for achieving this integration is the Country Water Resources Assistance Strategy. These strategies will build on the normative strategic work done in the region and develop more operational strategies that take into account the political economy of the country and result in sequenced, prioritized engagement by the Bank.
- In Latin America and the Caribbean too, the regional water adviser is a sector manager, this time responsible for the urban and water portfolio in the Private Sector and Infrastructure Department. The regional appointment has been mirrored in joint appointments with Environmentally and Socially Sustainable Development in key countries (notably Brazil). These changes have made a large difference in the coherence of the Bank's work in water resources in the region and have contributed to rapid growth in the regional portfolio of water resources investments.
- In South Asia the regional adviser was recruited with a mandate to provide leadership on water resources in the region. The adviser reports to the director of the Regional Environment Department. There is no formal structure for coordinating the Bank's work on water resources and no joint accountability for work on water resources in other departments. The Re-

This Strategy does not propose any fundamental organizational change, but rather a fine-tuning of institutional arrangements to ensure accountability and resources

Modest additional resources are being made available to the regional water advisers to facilitate the necessary strategic leadership and coordination within their regions

gional Management Team has recognized the importance of strategic investment in sector staff capacity that is not driven by short-term budget priorities and has decided to allocate resources to the regional water adviser for strategic work not directly related to country or regional operational tasks.

- The East Asia Region has been operating under a more informal approach to water resources management than other regions. Two years ago the region appointed the first regional water adviser. Although the informal approach has been effective, regional management is designing a more defined approach, including the establishment of a virtual water team coordinated by the regional water adviser that will have responsibility for preparing and implementing cross-sectoral activities, such as regional and country water resources strategies; enhancing quality through reviews of project concept, appraisal and other related documents and analytic work; and improving coordination of water-related activities throughout the region.
- In Europe and Central Asia responsibility for coordinating the Bank's work on water resources is shared by a manager with responsibility for natural resources and a water professional with extensive operational responsibilities. Information sharing and coordination of the modest but gradually expanding water portfolio are done informally but effectively.

As a result of the discussions that were part of this Strategy, modest additional resources are being made available to the regional water advisers in some regions to facilitate the necessary strategic leadership and coordination within their regions. These resources must necessarily come out of regional budgets and be assigned after considering this and other priorities.

In the anchors

Seven years ago, in response to the World Bank's 1993 Water Resources Management Policy Paper, a Global Water Unit was set up to help the Bank become a better partner in implementing the principles of integrated water resources management articulated in

the Policy Paper. A core task was to improve coordination among the disparate parts of the World Bank Group that worked on water resources, to ensure greater coherence. The manager of the unit (the senior water adviser), reported to the vice president of Environmentally and Socially Sustainable Development.

In 2000 the president of the World Bank Group announced a ramping up of organizational arrangements for water resources in response to the growing consensus that water resources was emerging as a critical development issue and with the understanding that greater coordination across units working on water was vital. The vice presidents of Environmentally and Socially Sustainable Development and Private Sector and Infrastructure announced the creation of the Water Resources Management Group with some of the functions of a Sector Board, namely enhancing the quality of lending and analytic work, human resources, corporate positions and outreach, and knowledge management.

Members of the Water Resources Management Group are the regional water advisers, as well as the leaders of the anchor units on water supply and sanitation, irrigation, hydropower and environment and key staff working on water-related issues in the IFC, MIGA, the Legal Department and the World Bank Institute. The group is chaired by the senior water adviser. By agreement between the vice presidents of Private Sector and Infrastructure and Environmentally and Socially Sustainable Development, the Water Resources Management Group and the anchor unit (the former Global Water Unit) are housed in and financed by Environmentally and Socially Sustainable Development.

In some respects the Water Resources Management Group has worked reasonably well. It has managed major policy tasks (including the response to the report of the World Commission on Dams and this Strategy); it has managed the major water partnerships (including the \$14 million World Bank–Netherlands Water Partnership Program, the Global Water Partnership, the World Water Council) and the World Bank's engagement in major events (such as the World Water Forums and

the World Summit on Sustainable Development); it has developed a Human Resources Plan for Water Resources in the World Bank and effective collaborative arrangement on substance with all relevant Sector Boards and on water resource-related human development issues with the Water Supply and Sanitation and Rural Development Boards (which most staff working on water resources are mapped).

But to provide the necessary leadership and coordination in this vital and growing area, two modest changes will take place in the operation of the Water Resources Management Group. The chair of the group (the senior water adviser) will formally report to the vice presidents of both Private Sector and Infrastructure and Environmentally and Socially Sustainable Development and both units will contribute to the budget for the Water Resources Management Group and the anchor unit.

Human resources

As part of its mandate, the Water Resources Management Group has done an extensive survey of staff working on water resources, and developed a draft Human Resources Strategy for water resources.

Some 230 staff in the World Bank deal with water resources on a full- or part-time basis—about half from Environmentally and Socially Sustainable Development and half from Private Sector and Infrastructure. About 80 percent would consider having water resources as a family affiliation were the option available. Renewal of experienced staff is a major challenge, with half of staff (the most experienced half) due for retirement in the next 10 years. About 15 percent of the 169 survey respondents spend up to 100 percent of their time on water resources management activities, and half spend up to 25 percent. This implies that water resources management training and knowledge management need to be made available to a wide variety of staff, not only those who work full time on water resources management issues.

Survey results and experience from the annual World Bank Water Week and water resources seminars reveal that the over-

whelming majority of staff are interested in training in both water resources management and knowledge management. Needs are greatest for legal, institutional (river basin management, international waters) and financial and economic expertise, in addition to drought, flood, coastal zone and groundwater management and water and environment issues.

The objective of the water resources management Human Resources Strategy, as approved by the Water Resources Management Group, is to ensure that the right number of staff have the right skills and motivation to respond to the mounting challenges in client needs and demands in water resources management. The Human Resources Strategy consists of four building blocks:

- The World Bank needs to maintain and renew a well-trained, experienced *core group of water resources professionals* who can prepare and supervise projects and maintain a high-level policy dialogue, including strategy and economic and sector work. They should have a background in at least one area related to water resources management that provides a multidisciplinary vision as the basis for becoming integrators of cross-cutting issues between water sectors and dealing with the highly varying content of current and future water resources projects. Sector staff (water supply, energy, agriculture) continue to specialize in their sector, but need to improve their knowledge about the linkages to other water sectors in order to make good policy and investment decisions.
- A specific *career stream* needs to be spelled out for core water resources management staff in order for the World Bank to be able to attract, maintain and develop the needed talent and skills.
- A *training program* is being developed, in a partnership between the Water Resources Management Group and the World Bank Institute,¹⁹ for core water resources staff. It will include drill-downs in water resources legislation and institutions with practical applications; water resources economics; groundwater, drought and flood management; water and environment issues; and a base course to provide staff working mainly in water-related sec-

Water resources management training and knowledge management need to be made available to a wide variety of staff, not only those who work full time on water resources management issues

Bank re-engagement with high-reward-high-risk hydraulic infrastructure implies a re-aligned profile of professional staff

tors with a more integrated water resources management perspective.

- *Knowledge management* activities, especially of a cross-regional nature, will be further developed by the Water Resources Thematic Group, the knowledge management arm of the Water Resources Management Group. Again the resource limitations of the Water Resources Management Group have meant that progress has been slow.

Bank re-engagement with high-reward-high-risk hydraulic infrastructure implies a re-aligned profile of professional staff. Specifically, after a decade of focusing on recruitment of social and environmental staff, there is need for a new emphasis on recruiting experienced technical staff. As with most other staffing decisions in the Bank, this will not take place through a center-driven process, but in response to changing demands from the regions.

The fact that water resources is a cross-cutting issue and not a sector in the Bank poses special challenges in recruiting and retaining specialized staff. The Sector Boards (especially the Water and Sanitation, Rural, Energy, and Environment Sector Boards) have responsibility for recruitment and human resource actions for staff who work on water resources. The Water Resources Management Group recognizes that primary responsibility is with the Sector Boards, and so the group offers to play a quality enhancement role. This has worked well with the Water and Sanitation Board for some time, and is now working well with the Rural Board, too.

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4. WHAT THE STRATEGY MIGHT MEAN FOR WORLD BANK ENGAGEMENT: SOME EXAMPLES FROM THE REGIONS

In any given country setting the World Bank's activities in water resources management are the result of three principal drivers: the nature of the challenges in the country and society's approach to them; the Country Assistance Strategy, in which the government and the World Bank agree on priorities and approaches; and the strategic thrusts of the 1993 Water Resources Management Policy Paper and, now, this Strategy. The following sections give some sense of how the strategic directions highlighted in this Strategy are likely to influence the World Bank's activities in water resources management in one country in each of the World Bank's regions, with a particular emphasis on the following issues:

- *Management:* How can the general principles of the 1993 Policy Paper be applied to widely varying local contexts, with an emphasis on sequencing, patience and attention to the political economy of reform?
- *Infrastructure:* What is the likely engagement of the World Bank in hydraulic infrastructure of varying scales, including high-reward-high-risk infrastructure?

The examples show that the challenges facing different countries and regions vary widely and that appropriate support from the World Bank similarly varies widely. This diversity notwithstanding, it is clear that in most settings Bank engagement will involve a mix of knowledge and investment services, which include both management and development components.

Illustration 1: What the new sector Strategy might mean in Brazil

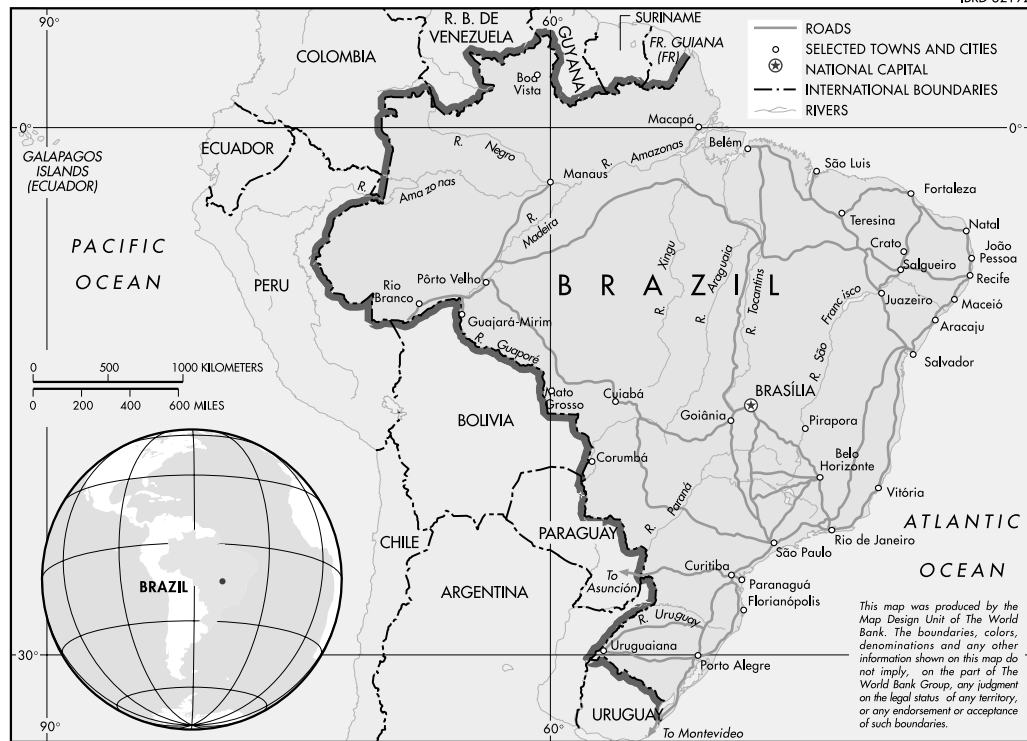
Brazil is the eighth largest economy in the world (map 4.1), and a country with strong

domestic capacity in water service and water resources management.¹ During the last decade, the country has adopted unprecedented reforms of the legal and institutional framework for water resources management at the federal and at the state levels. These reforms, based on the Dublin Principles, were passed by Congress after a broad consultation process with civil society and political representatives. The World Bank has been a key partner of the government in advancing the reform agenda and has a Country Assistance Strategy that builds on its comparative advantage and value added.

The World Bank has a long history of engagement with water management in Brazil. In the early years World Bank cooperation focused on building the infrastructure necessary to meet the water supply, irrigation and energy demands of a rapidly growing and urbanizing economy. As this first wave of primary demands was met, the focus shifted to second-generation challenges:

- *In the urban sector.* Development of financially viable urban water and sanitation utilities and, recently, stimulation of private sector participation and formal approaches to regulation; development of technologies and social approaches for increasing coverage (especially of poor people) with affordable sewerage services; and addressing the increasing challenges of the urban environmental agenda (water source protection, wastewater management and treatment and urban drainage) in large and medium-size metropolitan areas.
- *In the energy sector.* Liberalization and development of an appropriate regulatory structure (which includes many river

The World Bank has a long history of engagement with water management in Brazil



DECEMBER 2002

basin and water rights issues since hydropower accounts for 90 percent of electricity supply in Brazil).

- *In the rural sector.* Devising innovative technical and institutional models to deal with water and soil management on small watersheds, expanding water and sanitation services in small localities based on community-driven models and private sector participation, stimulating new forms of irrigation user organizations and transforming the focus of irrigation from rural welfare to commercially oriented growth enhancing employment generating agriculture.
- *On water resources management.* Stimulating innovative approaches to participatory resource management at the state and federal level, including the development of appropriate financial, legal, regulatory and institutional approaches; and supporting infrastructure and management arrangements for sustainable water services in the dry and poor areas of Northeast Brazil.

Over the past decade the World Bank has been engaged directly in the political economy of water reform. A first key element was the engagement of leading political figures in understanding the stakes, in seeing (through continuous policy dialogue, seminars, sector work, study tours and other mechanisms) the means for making changes and in supporting legislative and institutional reforms at the federal level. Over the past five years this process was facilitated by the World Bank's decentralization policy. The World Bank's resident country director has been immersed in the political reality of the country, and field-based staff were easily accessible to all stakeholders and perceived as full-time partners.

A second key element has been focusing concentrated advisory and investment resources in "reforming states," which have shown the way now being followed by many other states. A third element has been a move toward demand-driven projects with clearly established eligibility and ranking criteria. This has meant opening programs to

municipalities (in the case of urban utilities) and states (in the case of water resources management in the Northeast) that commit to making fundamental reforms. These changes in business practices, important in themselves, have also had demonstration effects. For example, in a water resources project in the Northeast the World Bank introduced a screening tool designed to ensure that all infrastructure was financially and environmentally sustainable. The government has adopted the process and made it mandatory for all federally funded projects. The new National Water Agency (ANA) has taken the logical next step (consistent with the paying for results, or output-based aid approach now being piloted as part of the World Bank's new Private Sector Development Strategy) of using pollution control resources not to build treatment plants but to pay for results (in this case, treated effluent). Fourth and finally, the World Bank's engagement has been the result of a strategy that stressed selectivity based on poverty impact, comparative advantage and value added.

The country stakeholders' generally positive perception of World Bank engagement has been dampened, however, by one widespread concern about the evolution of the relationship with the World Bank in recent years. Country officials have been concerned about the direction in which the World Bank's business practices are evolving, which they see as increasingly focusing on minimizing reputational risks, sometimes at the expense of urgent development impact. The general view is summed up by one of the most admired political reformers in Brazil: "When I have to build, at the request of local people, a small dam in the semi-arid interior, the World Bank makes me go through due diligence processes that are the same as if I were building Itaipu [the world's largest hydroelectric dam]."

Leading political and professional figures in Brazil stress that the value of the World Bank is not in dealing with the routine. What they want is World Bank engagement (sometimes by providing advice, sometimes through lending too) in the difficult issues that are now at the fore in Brazil. These include major hydraulic infrastructure proj-

ects, such as the proposed interbasin transfer out of the Rio São Francisco in the Northeast; the "water highway" up the Paraná River, which is vital for the export of agricultural produce from the interior; or the further development of hydroelectric power in the Amazon Basin. This, in the eyes of many leading Brazilian thinkers, is where the World Bank is really needed—for its ability to link the macroeconomic, financial, environmental and social aspects with the technical issues and to mobilize knowledge from global experience.

The World Bank and the government are currently in the process of refining their cooperation strategy in a Country Water Resources Assistance Strategy in light of the main messages emerging from this Water Resources Sector Strategy. While the process is not yet complete, the main lines are clear:

- Continued support through investment and advisory services to cutting-edge water resources management programs in states that undertake water reforms. This will concentrate on the Northeast, which is both dry and poor. Support will continue to be made available to reformers on a demand-driven basis. Particular emphasis will be placed on the definition of rights and licences and their management at the state and federal level.
- Continued support through dialogue, sector work and lending to complete reforms in the legal and regulatory framework of water supply and sanitation services delivery to improve the efficiency of utilities, expand coverage to poor people and reduce alarming levels of water pollution in selected urban river basins.
- Major support for developing effective institutional arrangements and financing priority investments in a few stressed river basins. This is likely to mean a focus on the multistate Paraíba do Sul River in the Southeast (where pollution control and protection of drinking water quality are the main challenges) and on the multistate São Francisco River in the Northeast (where the challenges are primarily quantity management, management of the cascade of dams down the river and interbasin transfers out of the

Leading political and professional figures in Brazil stress that the value of the World Bank is not in dealing with the routine but in the difficult issues that are now at the fore such as major hydraulic infrastructure projects

river). Major issues include the role of the federal and state governments, participation in the basin agencies and allocation and management of consumptive and nonconsumptive water rights.

- Support to the new National Water Agency (ANA) in a number of ways, including:
 - Linking support to ANA with support to reforming states as part of a “parallel track strategy” of federal and state initiatives.
 - Supporting ANA in identifying roles for states and the federal government in water rights and administration.
 - Supporting ANA and the states in developing the information and human resources required for more effective water resources management in priority basins.
 - Helping pilot the output-based aid model for pollution control. This will include collaboration in monitoring experience and improving business practices in this innovative program by identifying business risks and devising strategies for mitigating them.
 - Support for ANA in the development of its strategic planning and business management approaches.

As with the other focus country studies the experience of the World Bank in Brazil had a substantial impact on the main messages of this sector Strategy, highlighting the importance of:

- Developing sequenced, prioritized approaches to dealing with the daunting set of water-related service and resource management challenges.
- Giving priority to acting where there is a strong demand for change, and supporting political reformers willing to implement that change.
- Starting with the low-hanging fruit and then, with credibility and experience, moving on to bigger challenges.

Finally, Brazil brings to the fore the issues of development and reputational risk and the imperative that the World Bank stay engaged, even in middle-income countries, in the twin challenges of management *and* development.

Illustration 2: What the new sector Strategy might mean in Central Asia

The countries of Central Asia (map 4.2) are water scarce.²The Amu Darya and Syr Darya Rivers are the principal water sources, especially for the downstream countries of Uzbekistan, Turkmenistan and southern Kazakhstan, which have largely desert climates. Irrigation has been practiced in Central Asia for millennia, but irrigated area almost doubled between 1950 and 1980, leading to large-scale diversions of water from the rivers and an 80 percent reduction of the water flow into the Aral Sea. About 35 million people depend in one way or another on irrigated agriculture. The shrinking of the Aral Sea, whose surface area has declined by half over the last 40 years, has meant economic losses for the 3.5 million people living near the sea—from declining fisheries and loss of wetlands to health impacts from blowing salt and highly saline shallow groundwater.

Irrigation has played a central role in the economic development and environmental decline of Central Asia. The former Soviet Union invested massively in surface irrigation systems in the downstream states, primarily for the production of cotton. Some 8 million hectares are under irrigation. In Uzbekistan, for example, irrigated agriculture is the backbone of the economy, contributing 35 percent of GDP, 60 percent of foreign exchange earnings and 45 percent of employment. Irrigation in Central Asia faces a host of converging, major challenges—of sustaining as much economic productivity and employment as possible, of generating greater livelihoods from less water (70 percent of which is currently lost through leakage), of developing new forms of organization to replace those of the Soviet era and of reducing adverse environmental impacts.

As in other parts of Europe and Central Asia and in other regions, the World Bank has promoted the role of water user associations, with some success especially in Kyrgyz Republic. But effective irrigation is impossible without functioning infrastructure. A key challenge, accordingly, is rehabilitation of irrigation infrastructure. Infrastructure has



Whereas the tradeoffs between water and energy were previously internalized in the command and control system of the Soviet economy, they are now much more visible and need to be managed more explicitly

deteriorated over the last 10 years as institutions have weakened, systems for funding operation and maintenance have collapsed and adequate alternatives have not yet been put in place.

Particularly important for irrigation management in arid lands is removal of drainage water. The excessive application of water to irrigated lands has led to waterlogging and salination. Some 6 percent of the irrigated area now has highly saline soils, and water tables are now within 2 meters of the surface for about 35 percent of the area. Salinity levels and unreliable water delivery are especially severe problems at the tail-end of the irrigation system, in the deltas of the Amu Darya and Syr Darya Rivers. The World Bank is working with borrowers and partners in Central Asia to develop a drainage and salinity management strategy and to fund priority drainage works.

Hydropower plays a major role in the region, accounting for 35 percent of electricity generation in the Aral Sea Basin countries.

Before 1990 water in the basin was managed as a single, integrated irrigation system, with water stored in the winter and released during the growing season to downstream areas. The lower riparian areas, rich in thermal energy sources, provided coal, oil and gas to the upstream areas for winter heat.

Since the 1990 breakup of the Soviet Union and moves toward market pricing for thermal energy, the management system has changed. The upstream countries, with very low per capita incomes and few natural resources apart from hydropower, have increasingly released water from reservoirs in winter to generate electricity for heating and to save the foreign exchange costs of imported fossil fuels. But these winter releases of water for electricity are incompatible with the summer demands of the downstream countries for irrigation. Whereas the tradeoffs between water and energy were previously internalized in the command and control system of the Soviet economy, they are now much more visible and need to be managed more explicitly. The countries do have cooperative and

barter arrangements, but these do not always work well. And countries have differing views on what is a “fair” price for electricity.

Solutions include development of more equitable, mutually agreeable financial or trading arrangements, construction of increased water storage and hydroelectric generating capacity in Kyrgyz Republic and Tajikistan (possibly jointly financed with the downstream countries) and construction of increased water storage for irrigation in Kazakhstan.

As in many other developing regions water and sanitation utilities in Central Asia are having to make a transition toward financially autonomous, accountable utilities that recover their costs from the charges paid by users. The World Bank has been, and will remain, involved in working with its borrowers in making these transitions. To date this has been difficult, especially in the poorer countries, because of low incomes, perceived social risks of increasing water tariffs, and an unfavorable investment climate for the private sector. The World Bank has had more success in developing community-based approaches to water supply and sanitation in rural areas, and has projects in several countries.

Water supply and sanitation utilities in the industrialized parts of the region face a particular resource problem as a result of pollution of surface water with toxic chemicals from industrial discharges and from leachates from abandoned mine tailings. World Bank engagement in water supply for the new Kazakh capital of Astana illustrates what good economic and environmental advice can contribute. Faced with high levels of mercury in the nearby river, the government was planning to construct a long-distance inter-basin transfer. A National Environmental Action Plan and World Bank-supported sector work showed, however, that cleaning up the mercury was far more cost effective (with a cost of bulk water of about US\$0.08 per cubic meter instead of the US\$0.80 for the inter-basin transfer).

The countries of Central Asia face a unique set of challenges in developing and maintaining an appropriate stock of water infrastructure. For the most part, the problem is

that there is more infrastructure than can be maintained. In irrigated areas the World Bank has worked with borrowers in applying immediate band aids to critical infrastructure, but also on medium-term strategies for determining which infrastructure (both supply and drainage) should be maintained and which retired. Recent analytical work has indicated that system rehabilitation, combined with demand management, can reduce crop water requirements by more than 30 percent. This work also shows that the majority of serviced area can economically be irrigated, even if users pay the operation and maintenance costs for water and drainage infrastructure. But water prices can be increased only when water delivery is reliable and when farmers receive a fair market price for what they produce. Agriculture is now effectively taxed by price and trade restrictions on several key commodities. The key, then, is seeing water pricing reforms as a component of an overall package of institutional reforms and infrastructure investments, with attention given to prioritization and mechanisms for effecting transitions.

Urban water and sanitation utilities in the former Soviet Union also have a peculiar set of infrastructure challenges. First, domestic water supplies were heavily subsidized, and per capita use was extraordinarily high (typically around 400 liters per capita per day) and wasteful. This meant that both water supply and wastewater treatment plants were often overbuilt. As water use (and sewage production) has fallen to about 100 liters per capita per day, there is often large overcapacity in terms of treatment and a need to retire major pieces of infrastructure.

With regard to dams, the primary challenge is to maintain existing stock in a serviceable and safe manner. The World Bank continues to be involved in working with countries to ensure dam safety, including Lake Sarez in Tajikistan, formed after an earthquake, and currently the highest dam in the world. Another challenge is monitoring and disseminating data on river flows, precipitation and temperature. With the decline in public funding in the past decade hydrometeorological equipment has become outmoded, and data systems are no longer reliable. Existing data series indicate that Central

The countries of Central Asia face a unique set of challenges: for the most part, the problem is that there is more infrastructure than can be maintained

Asia will be affected by climate change, with temperatures, precipitation and net evapotranspiration rising, and extreme weather events becoming more frequent.

In summary, the challenges of water resources management and development in Central Asia are daunting. Solutions do not lie within the water sector alone. Rather, progress (which will continue to be slow and difficult) requires concerted and integrated action in a wide variety of sectors (including the usual water-related sectors, but also macroeconomic, fiscal, governance and social). For the World Bank to be an effective partner, it has to use both analytic and investment tools. It must also foster internal and external partnerships, so that there is consistency in the actions of multiple partners. The World Bank's work in Central Asia accordingly includes the following elements:

- Work on a regional water strategy that will build on this sector Strategy and regional experience.
- Analytic and advisory work in Central Asia analyzing the economic, social and environmental feasibility of irrigation rehabilitation, the energy-water nexus, water and salt strategies, and water and wastewater strategies in industrialized areas.
- Gradually increased lending for irrigation and drainage rehabilitation, within countries' macroeconomic and borrowing constraints.
- Support to wetland, grassland and fisheries restoration in delta areas.
- Continuing work on mitigating the effect of the Aral Sea environmental catastrophe by improving living conditions and reducing poverty for the millions living near the sea.
- Support to water user associations for managing on-farm irrigation and drainage infrastructure and for strengthening transparent financial management of water delivery institutions.
- Lending for improved soil and water conservation and watershed protection in rainfed agricultural areas, rangelands and forested areas.
- Continued assistance to address the legacy of water pollution from mining and industrial waste.

- Assistance with restructuring water utilities in major urban areas, to improve service levels and move toward financial viability.
- The use of both advisory and investment tools for facilitating benefit sharing on international rivers.

The World Bank's ongoing and planned work in Central Asia both supports and feeds into the main themes of this Water Resources Sector Strategy. The challenge is the use of both management *and* infrastructure instruments, with infrastructure instruments largely confined to the development and implementation of a strategy for maintaining an appropriate stock of infrastructure. It is also apparent that the task is identifying a prioritized set of policies and actions that can help manage this very difficult transition. As elsewhere, management of the political economy of change at all levels—the farm, the city, the country and among riparians—is the overriding challenge, and one that the World Bank is addressing with the full range of its analytic and investment tools.

Illustration 3: What the new sector strategy might mean in India, in particular in the state of Andhra Pradesh

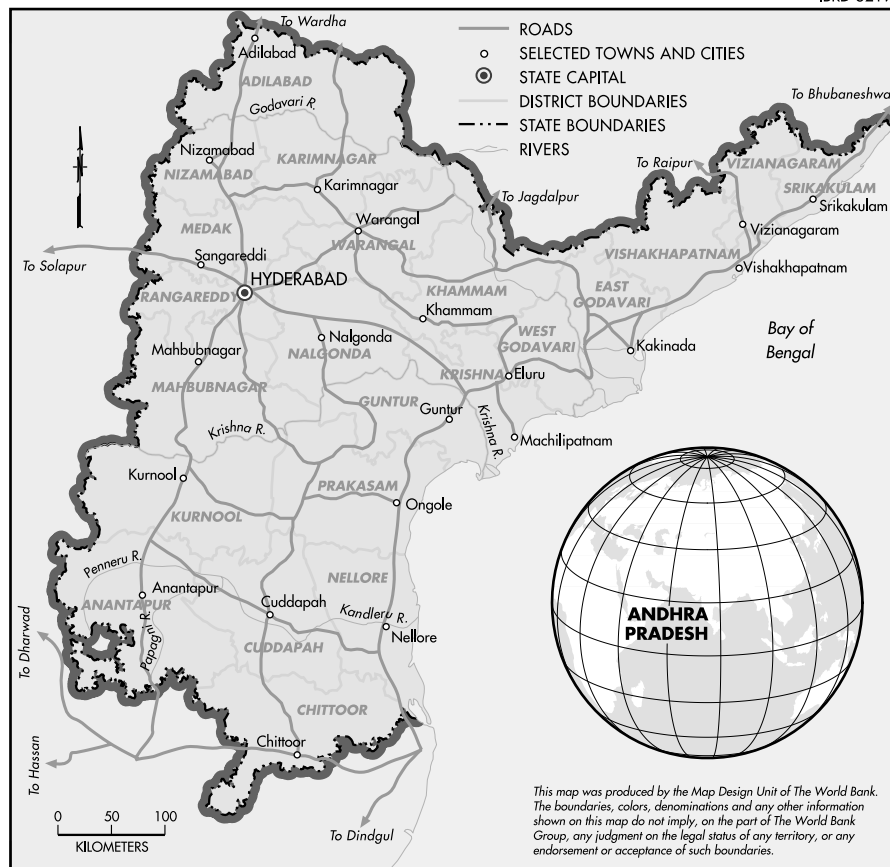
Water resources management and development has played a major role in development, food security and poverty reduction in India.³ These investments have led to an enormous increase in the production of food and food grains, with major positive impacts for the many poor people who are net food purchasers, large declines in poverty (with poverty rates in unirrigated districts almost three times the level in irrigated districts) and large multiplier effects (on the order of two) in terms of secondary and tertiary economic impacts.

The World Bank has been a key partner for India in water development over the decades. In addition to assisting in the achievements mentioned above, the World Bank has played a major role in negotiating the historic Indus Water Treaty with Pakistan and in providing the investments in water

Water resources management and development has played a major role in development, food security and poverty reduction in India

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The World Bank can be most effective when it identifies reforming political leaders and provides them with backing for their reform programs

development projects that underpinned the treaty.

Over the past decade and more, however, water development and management challenges in India have changed. While important opportunities remain for the development of water resources (for hydropower in the mountainous states, for example), the major challenge has shifted to getting the greatest productivity from existing resources, paying greater attention to the environment and managing scarce resources in an efficient and accountable manner. In too many cases the result has been stagnation or standoff. Stagnation in the sense that failed institutional models have not been reformed and standoffs between proponents of water projects (who point to their economic benefits) and opponents (who tend to emphasize the economic and social costs). During this period the World Bank struggled to find a

role more suited to the challenges facing the country and more broadly accepted by all parties.

In recent years the World Bank has taken a radically different position to overall engagement in India. The pillars of this reform strategy, as laid out in recent Country Assistance Strategies:

- The central issue is not vision, but how to move from here to there, or the political economy of reform.
- The World Bank is able to exert little leverage through conditionality.
- The World Bank can be most effective when it identifies reforming political leaders and provides them with backing for their reform programs.

What has this change meant, and what might it (in conjunction with this Strategy)

mean for future World Bank work in water management in India?

Irrigation is the largest water-using sector and the key to improved water resources management in India. As in many other countries public irrigation agencies, so important to food security, rural development and poverty reduction, have become inflexible and ineffective in providing the services that users demand. The World Bank has recognized for some time the importance of reforming the way public irrigation services are provided, but has struggled in finding a way to translate ideas into actions.

A critical turning point came in the late 1990s, with the World Bank's focus on reforming states. The first and strongest reformer was the government of Andhra Pradesh (map 4.3). Drawing on international best practice, the World Bank provided strong support for the introduction of water user associations as a first step in this reform process. With strong political and bureaucratic leadership from the state, water user associations were formed in all of the state's public irrigation systems. This ambitious experiment shows initial signs of success. Last year, for example, during a severe drought, water distribution and overall productivity improved. The success is attributable to two factors: the intelligence and ingenuity of farmers, and the extraordinary political and bureaucratic leadership. (To cite just one example, every few weeks the chief minister has a videoconference with senior administrators in each of the 20-odd districts. Central and district administrators are called on to account for their performance, including in managing irrigation systems. Equally remarkable, the press, both in the capital and the districts, is invited.)

The Andhra water user association revolution has set a standard for other states to follow. As a group of Haryana farmers who went on a study tour of Andhra Pradesh noted: "Andhra farmers are poorer, but they pay much more for water than us.... they are happy, because they get better service...and better cooperation between Agriculture and Irrigation Departments....we would pay more if we got better service.... this will not change if there are political changes, because

the Andhra farmers say they will not allow a new government to give them free water."

Global experience shows that water user associations are a necessary but not sufficient condition for improving irrigation performance. Equally important (and generally much more difficult) is reforming the way in which managers of the infrastructure (the irrigation departments in India) perform. The state government of Andhra Pradesh realizes that this is the next challenge. Discussions with the World Bank center on the assessment of options for developing service providers that operate on modern institutional principles, including competition and accountability to users and for management and maintenance of assets.

On the water resources side the challenge in Andhra Pradesh is to assist the state in its efforts to be a facilitator. For example, the state (which is an emerging global software center) has made substantial advances in the collection of data, but interpretation and use of those data for decisionmaking lag behind. The challenge includes developing a legal, regulatory and institutional basis for making water reallocation more flexible and voluntary, with careful attention to the highly sensitive issue of the water rights of users and to ecological requirements (for example, releases into estuaries for the sustenance of mangrove swamps and fisheries). These are key elements of an integrated river basin approach to water management, a central principle in the Indian National Water Policy and in the water policy of most Indian states. It fits well with the government of Andhra Pradesh's SMART (Simple, Moral, Accountable, Responsive, Transparent) philosophy. But it is a task that will take decades of persistence to complete, as well as a sequenced, prioritized program of actions tailored to the political realities as they evolve. The World Bank is, and is likely to remain, a central partner for both advice and investments in advancing this ambitious and vital agenda.

While supporting "the focus states with integrated packages of fiscal, civil service and sector reforms" remains the foundation of the World Bank's India Country Assistance Strategy, there is also room to support stand-alone innovations in "nonfocus states" that

Discussions with the World Bank center on options for developing service providers that operate on modern institutional principles, including competition and accountability to users

The World Bank is actively engaged in Andhra Pradesh in the provision of knowledge and advisory services: on benchmarking and irrigation reform options, on utility reform, on groundwater management and on water rights administration and ecological flows

will both directly address poverty and have a high likelihood of a demonstration effect because of commitment to reform or good sector performance. Thus, for example, the World Bank has supported a series of successful watershed management projects in the Himalayan foothills and a project for the reclamation of sodic lands in the Gangetic plains. In both cases the beneficiaries are poor farmers and the environment.

In the urban water sector, the World Bank has (as in irrigation) a long history of country activity within the existing institutional framework, but with mixed results. Accordingly, the World Bank has decided to discontinue financing urban utilities unless they are associated with major institutional reforms. The World Bank is now focusing its analytical and advisory services on states that have shown commitment to fiscal and institutional reforms.

In hydropower the World Bank's strategy is much the same. India has substantial undeveloped hydropower potential. But the electricity sector still has major institutional and financial problems. The World Bank has declined to finance the development of new generation capacity (including hydropower) and would only consider re-engaging if there are fundamental energy sector reforms. If this happens, and if new hydropower generating capacity is an appropriate option, World Bank involvement is likely to be primarily in the form of guarantees for private sector participation.

Most of the infrastructure challenges in India relate to the more effective use of existing infrastructure and to the environmental and financial sustainability of that infrastructure. That said, there are still challenges relating to the development of water resources, as illustrated in Andhra Pradesh. The waters of one major river in the state, the Krishna, are fully developed, but there is considerable potential in the other major river, the Godavari. The problem is an elevation separation of about 300 meters from the place where the water is available to the place where there is land and a major demand for water (with entitlement issues going back to the pre-independence days of the Nizam and with water scarcity contributing to endemic security issues). A

simple economic analysis shows that developing these water resources for irrigation is not the best use of limited financial resources. But the political and security imperatives are great. While the state has decided not to build major dams (because of forest submersion and resettlement issues), it is likely to proceed with some form of lift irrigation. The World Bank can and probably should play a productive role by working with the state on exploring options (new technologies, staged development, pilot schemes) that will meet the real political and security needs while maximizing the likelihood of sustainability and limiting fiscal damage to the state.

The World Bank is actively engaged in Andhra Pradesh in the provision of knowledge and advisory services: on the water components of the state's "2020 Vision" document, on benchmarking and irrigation reform options, on utility reform, on groundwater management and on water rights administration and ecological flows. While further World Bank investment support for Andhra Pradesh is yet to be discussed, a next-generation package might include:

- A sectoral adjustment-type approach in which the World Bank finances a part of the government's program of reforms and investments.
- Strong emphasis on a carefully sequenced and prioritized program of institutional reforms, efficiency enhancements and resource management measures both within the principal sectors (water utilities, irrigation) and for overall water resources management.
- A component of high-priority, well (but not narrowly) justified investments that would include modernization of major irrigation systems and some new investments, including possibly a phased, piloted Godavari lift scheme.

The World Bank's experience in India is a powerful illustration of the central messages of this sector Strategy. First, water resources infrastructure can be the basis for sustainable economic growth and poverty reduction and can even help to improve relations among riparian countries. Second, development must be accompanied by management reforms.

Third, reforms are difficult, and can only be made when there is demonstrated local political leadership. Fourth, when there is such leadership, the World Bank can play a vital role in bringing new ideas to the table and investing in ways to make reforms durable. Fifth and finally, reforms cannot be achieved in a day. The art of reform is defining a sequenced, prioritized set of reform actions, of picking the low-hanging fruit first, of not making the best the enemy of the good, and ensuring an appropriate incentive system for political leaders who take these risks.

Illustration 4: What the new Sector Strategy might mean in Nigeria

In many respects the Nigeria–World Bank relationship is atypical, given the World Bank’s disengagement during the years of military rule in the 1990s.⁴ With the return of democracy, however, the World Bank has re-engaged, opening a daunting set of challenges for the World Bank in which the two-way link between water and politics (present everywhere) is particularly evident (map 4.4). In the water sector the most immediate and visible problem is urban water and drainage services, with Lagos particularly prominent.

The recent performance of the water institutions—agencies for managing urban and rural water supply and sanitation, irrigation, and the domestic and international rivers—has been extremely poor. With a soaring and urbanizing population the challenges in the coming decades are immense. In response to this challenge, the World Bank has developed a multitrack engagement strategy that, in many respects, can be considered a “best practice” application of the main strands of this Strategy. The first track involves assisting Nigeria to rapidly address the most politically visible issues in innovative ways. The performance of public utilities has come to symbolize the poorest aspects of governance in Nigeria. Lagos is a test case. The publicly run Lagos State Water Supply Corporation has been described, in a recent consultant’s report, as “in a dramatic state of neglect, close to collapse,” and holds the dubious distinction of having the highest recorded level of unaccounted-for water

in the world. Only 4 percent of water production capacity goes toward the creation of revenue.

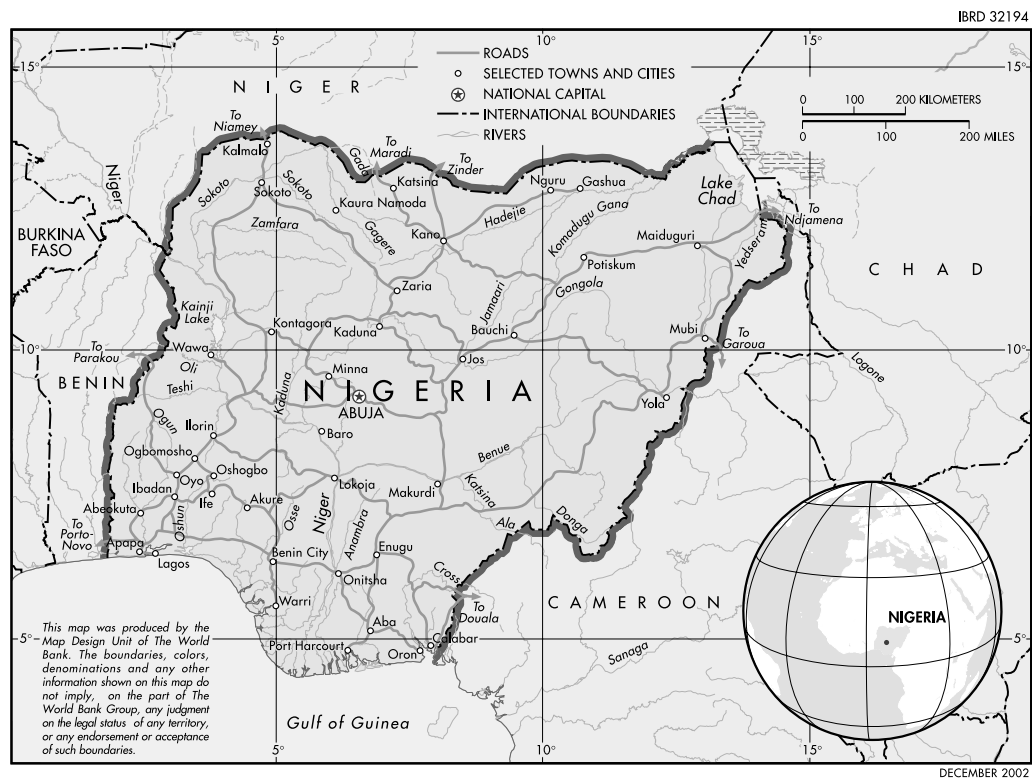
The World Bank (including IFC and the World Bank Institute) has been heavily involved in supporting the state and federal governments in exploring options, and modest gains have already been made. Lagos will be split into two zones. The first zone (Lekki and the Islands) is being prepared for private management through a concession contract, to be awarded by competitive bidding. The remainder of the city will be served by a less ambitious management contract, currently under preparation. Closely associated is the issue of drainage and sanitation in Lagos, an issue the World Bank is addressing through lending and advisory services.

The situation in many other Nigerian cities is not much different. Even in Kaduna, the greatest beneficiary of World Bank loans (for 20 years), the water utility still does not cover all of its operation and maintenance costs. The World Bank will support Kaduna, and as many as five other states where the political will exists, to undertake reforms similar to those in Lagos. In small towns, which have among the lowest service levels in Africa, the government, with World Bank support through a Learning and Innovation Loan, is piloting the innovative, demand-driven Small Towns Project, which includes community contributions to the construction costs of the facilities while contracting out the operation and maintenance to the private sector.

The second track of the World Bank’s strategy for water management in Nigeria involves addressing a series of important, though politically less explosive, water service challenges. These include developing a sustainable strategy for addressing the formidable urban sanitation and rural water and sanitation problems and following up on the World Bank’s successful family-based groundwater irrigation project. The World Bank might also address the large public sector irrigation projects run by the river basin development authorities, where less than 10 percent of the command area of 400,000 hectares actually gets regular supplies of ir-

For Nigeria, the World Bank has developed a multitrack engagement strategy that can be considered a “best practice” application of the main strands of this Strategy

m4.4 Nigeria



rigation water. Here the test for the World Bank is to bring best practice both to the user level (drawing on the growing body of experience with user associations in other countries) and the utility level (applying the ideas of benchmarking, competition, private sector participation and accountability).

The third track involves laying the groundwork for the longer term water management challenges in Nigeria. This includes working with the federal government to facilitate institutional rationalization, legislative reform and development of capacities for strategic water resources management planning. At the river basin level, it means supporting the development of modern stakeholder-based institutions for river basin management. As in other countries, this will require starting where there is a strong demand for reform. One place might be the juncture of irrigation, urban water supply and ecological flows for floodplain agriculture in the Hadeija Jamaare Basin. A second important area is micro watershed

management, on which the World Bank recently initiated an innovative first project with a strong poverty focus. And finally there is a set of important international water issues relating to management of the Niger and Benue Rivers and the Lake Chad Basin, where the World Bank is already playing an important facilitating role (with the assistance of Global Environment Facility funding). The focus in these endeavors has appropriately been on raising awareness and building capacity.

The experience of the World Bank in Nigeria, and the views of a variety of stakeholders on this experience, were important elements in defining the main strategic lines for this Water Resources Sector Strategy. It is not surprising, therefore, that the World Bank's strategy in Nigeria is broadly consistent with the main themes of this Strategy.

The political reality of Nigeria poses a major challenge in designing and implementing World Bank activities, especially those in-

volving infrastructure investment. Reputational risks are high because of complex environmental, social and governance issues. If the World Bank engages in such activities and cuts corners, there will inevitably be mistakes and blots on its reputation (especially in a country with many institutional limitations and a history of corruption). On the other hand, if the World Bank chose to require full comfort before engaging, progress on the ground would be slow, and the opportunity cost in terms of development benefits for the people of Nigeria would be great. In this case, the World Bank would be unable to make a contribution in the critical areas where the effectiveness of civilian rule will be judged and might therefore miss the window of opportunity which now exists.

In the past few years the World Bank has dealt with these challenges in imaginative and courageous ways. To a large degree the World Bank’s strategy for engagement with Nigeria is best practice under extremely challenging circumstances. This is so because the World Bank:

- Has developed a prioritized, sequenced and multitrack approach.
- Has built, where possible, on formidable grassroots capacities (for example, in the fadama irrigation project and the watershed management project).
- Has realized that without fundamental building blocks—sound institutions at the service level—there can be no progress on the more difficult resource management issues.
- Has realized that the best must not be the enemy of the good, and has thus proceeded with some radical changes (for example, through the concession contract for Lagos), aware of the significant room for improvement in governance and regulatory conditions and ready to support the government in identifying and managing the risks that will materialize in executing the contract.
- Has proceeded on parallel tracks in building the knowledge and institutional base for dealing with the longer run resource management challenges within Nigeria and in the international basins of which Nigeria is a part.

Illustration 5: What the new Strategy might mean in the Philippines

The recent experience with water management in the Philippines is a graphic illustration of one of the central themes emerging from the Operations Evaluation Department review of the experience in implementing the World Bank’s 1993 Water Resources Management Policy Paper (map 4.5).⁵ In particular, it is a striking example of how, in the words of that report, “Progress takes place more through ‘unbalanced’ development than comprehensive planning approaches and...institutional development efforts should abandon comprehensiveness of scope and schedule and a partial, cumulative, and highly focused approach [should be] pursued...”⁶

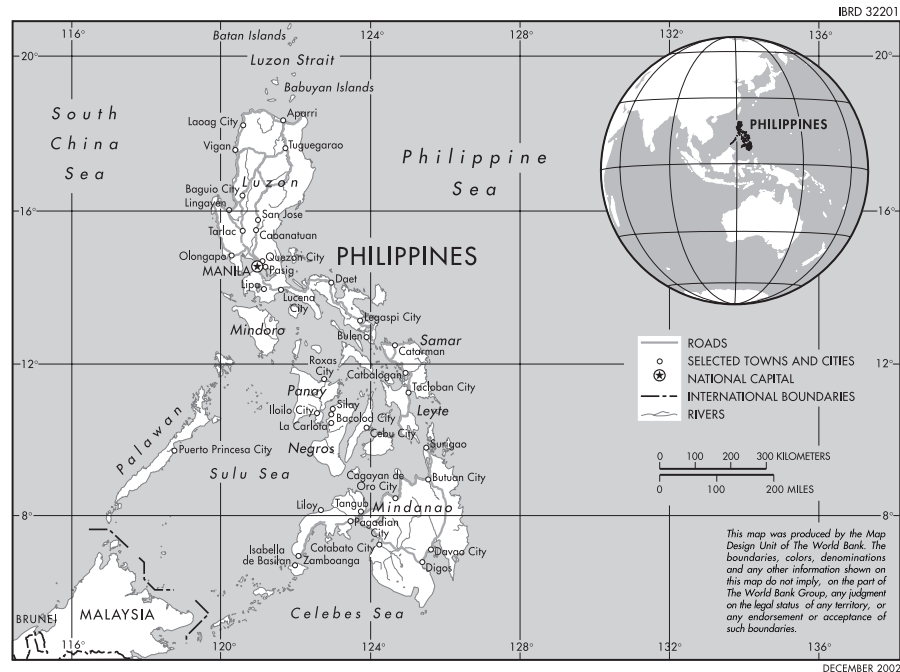
The first part of the Philippines story is the fate of a high-level effort in the 1990s to introduce comprehensive, integrated water resources management. Despite initial leadership by President Fidel V. Ramos, despite first-rate technical assistance from an external financing agency and despite the existence of an apex national water resources management agency, water resources reform was not successful.

The second part of the story relates to the direct and ripple effects of the decision to issue two concession contracts for water and sewerage services in Manila. President Ramos took this decision after the striking success with the introduction of private sector electricity suppliers. The World Bank was an enthusiastic partner, since the publicly operated water utility had become a textbook case for the failure of donor-supported incremental reform. (After 30 years of World Bank loans, unaccounted-for water had increased from 45 percent to 65 percent.) The IFC advisory service played a major role as an effective partner to the government in the concession process, which has become a model (documented in an excellent book by the civil servant who led the process⁷) of transparent governance. The Manila concessions are not yet stable and face major challenges in managing the effects of a major devaluation.

In urban water services, the World Bank, in partnership with public sector banks, is trying

Progress in water management takes place more through ‘unbalanced’ development than comprehensive planning approaches

m4.5 The Philippines



to build on the momentum of Manila and to respond creatively to the new reality of fiscal decentralization in the Philippines. The World Bank's urban water group is developing an imaginative portfolio aimed at consolidating the concessions in Manila (with special attention to regulatory issues and participatory performance audits), bringing lease contracts to small towns and focusing on difficult sewerage issues. An implicit element of this strategy is developing competition for the Local Water Utilities Administration, the national urban water supply agency that is now under heavy pressure to reform.

In resource management, the ripple effects from Manila are transforming the way water resources are managed in the Philippines. These transformations began with the Angat Dam, the main source of bulk water for Manila and for about 30,000 irrigated hectares. First, although water distribution has been concessioned, the Metropolitan Waterworks and Sewerage System, the old public agency, still has the bulk water rights and is under contract to supply water to the two concessionaires. The concessionaires have helped raise awareness of the need for

fair and transparent rules for addressing competing uses between urban and agricultural users and are helping develop a robust solution to the allocation issue. The hidden issues of allocation rules, water rights and fairness were thus brought to the surface by private sector participation in Manila. The World Bank has been active as a knowledge partner on water rights issues and is helping define transparent mechanisms for water reallocation under a transferable water rights framework with equitable compensation.

Second, the private operators of the concessions (international consortiums, led by Philippine companies) also understood that their raw water assets were threatened by erosion in the catchment and initiated programs for stimulating better land and water conservation practices in the catchment.

Given the illustrious history of water user associations in the Philippines (dating back to the 1970s, which have been an inspiration to much of the participatory irrigation movement around the world), there has been surprisingly little progress in modernizing irrigation management in the Philippines.

World Bank staff have long seen that reform of the National Irrigation Agency is necessary. However, as in so many other cases, the World Bank engaged in the gradual and difficult task of incremental reform. The unintended effect may have been to prop up an agency that has not been effective and accountable to users, in part because about 80 percent of its capital budget and a large part of its operating revenue come from donor funding.

The World Bank is re-thinking its approach to irrigation reform in the Philippines. The starting point is the idea that while user associations are key, reform of the service agency is central. And, again, the World Bank has much to bring to the table in terms of tools for assessing institutional options, for benchmarking and for stimulating competition among service providers. While there are encouraging signs of donor convergence on this issue, the essential ingredient will be political and civil service leaders willing to address the thorny issues of agency reform.

In water resources management, it is clear that effective action requires both working from the top (enabling legislation and support for local efforts) and from the bottom, where there is a real demand for solutions. There are water resources hot-spots in the areas around Manila and Cebu, with a third area of scarcity emerging in the Cagayan Valley in Northern Luzon. In Manila, privatization has helped catalyze reforms. In Cebu, local civil society has been the leader in pushing for solutions to the acute local water resources problems. In the past the World Bank has tended to engage in top-down river basin planning exercises in areas without strong demand for reform. In the future it will need to seek opportunities, going where there are immediate needs for reform and actors who want to make the changes happen.

As with the other focus country studies, the experience of the Philippines had a substantial impact on the main messages of this Sector Strategy. The Philippines experience indicates, in the words of one participant in the Manila consultation, that “the politics of reform is the politics of tension.” It has been the introduction of a new “creative tension” in the form of the concession contracts for

Manila that has given rise to a host of new (also creative) tensions to resolve in the service and resource arenas.

For the World Bank there are powerful lessons from the Philippines experience. These include:

- Acting where there are strong forces demanding solutions, and not in response to an idealized notion of how a sector should be managed.
- Understanding that the reform process is dialectic and never final—each success gives rise to a new, higher form of challenge.
- Providing reforming politicians and civil servants with access to international best practice, and with timely advisory services.
- Building on political momentum in one arena to stimulate reforms where new tensions are created.
- Backing away when it is clear that incremental reforms are perpetuating the status quo.
- Fostering the synergies that can be created when members of different parts of the World Bank Group and members of different World Bank families (in this case, rural and infrastructure) work together on water issues.

Illustration 6: What the new sector Strategy might mean in Yemen

Yemen faces one of the most dramatic water management challenges in the world (map 4.6).⁸ Most of the population lives in highland areas and depends almost entirely on groundwater for domestic, agricultural and industrial supplies. Over the last 20 years a groundwater revolution has taken place, with the widespread adoption of tubewell technology. While bringing prosperity to rural areas, this revolution is not sustainable. Groundwater is being pumped at a rate approximately four times that of natural recharge. This situation has dramatic short-term results, with some previously productive valleys already abandoned, with pumping depths already great and increasing constantly and with a sharp rise in conflict between users competing for disappearing

The Philippines experience indicates that “the politics of reform is the politics of tension”

Yemen faces one of the most dramatic water management challenges in the world: there is no way people can live where they do unless water is managed more sustainably

water resources. But in the long term the situation is even more serious, for there is simply no way people can live where they do unless water is managed more sustainably.

Compelling as the demographic and hydrological imbalance is, the odds are heavily stacked against effective action. Groundwater management is a classic open access resource management problem, which poses major difficulties even in the best of institutional environments. In arid parts of developed countries, for example, where there is excellent hydrogeological information, where decision support systems are available, where property rights are clearly defined and enforced and where there are strong local organizations, it still often requires the heavy hand of the courts to force actions that will lead to sustainable groundwater management. In Yemen none of these conditions are in place. The notion of national management and national legislation is unrealistic in a country with incomplete national integration and severe capacity constraints in all sectors. This means that groundwater management necessarily has to be done at the local level, aquifer by aquifer. Hydrogeology is a complex and frequently misunderstood subject. Clear, accurate and practical information on the hydrogeological consequences of different actions is available in only a few select settings in Yemen. And even where some information is available, the situation presents formidable challenges, including inequitable use of resources (with a handful of large landowners typically responsible for most of the abstractions), an absence of formal water rights and a lack of local institutional structures for managing the new type of conflicts that the tubewell has created.

Over the past decade the World Bank, together with other donors, has come to play an important role in the massive task that lies ahead of Yemen. The starting point for the World Bank, following the 1993 Water Resources Management Policy Paper, was the formulation of a regionwide water sector strategy for the Middle East and North Africa Region, a task that was completed in 1995. This exercise, involving extensive consultations with clients and partners, was the first of its kind in the World Bank. Building on the

regional strategy, the region took the next logical step of developing country strategies. The country water strategy for Yemen (1997) was in many ways also a pathbreaker, this time for the country water resources assistance strategies advocated as part of this new sector Strategy.

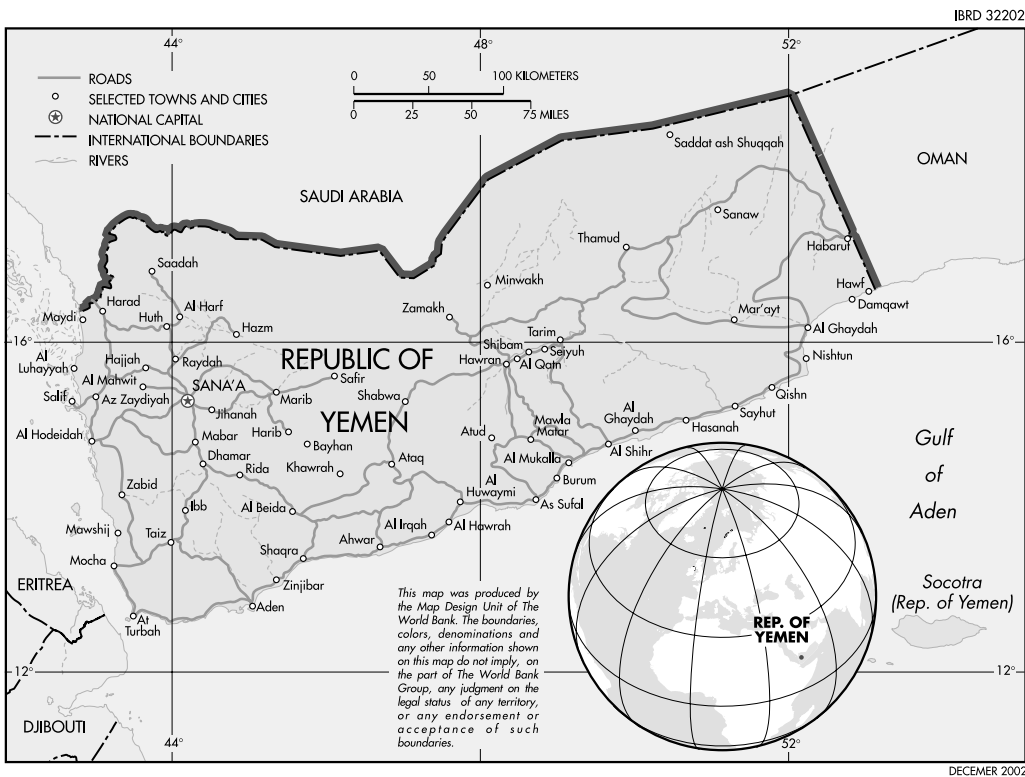
The hydrological, political, economic and social complexity of water management in Yemen made this strategic view particularly important. The Yemen water strategy also succeeded in highlighting the water issues in the government's development plans and, consequently, in the World Bank's Country Assistance Strategy.

Coincident with the formulation of the Yemen water sector strategy, the World Bank supported a set of pilot activities on key issues, intended as first steps in a long process of learning and adjustment. These first-generation pilot projects included efforts to:

- Improve the efficiency of water use in agriculture, focusing particularly on reducing real losses (water lost through evapotranspiration) rather than paper losses (water that percolates down into the aquifer).
- Reinforce strong, traditional, community-based management systems for managing flash flood flows.
- Improve the efficiency of urban water supply.
- Start to address the enormous task of sustainable management of selected aquifers.

As emphasized in this sector Strategy, a universal lesson of water reform is that it takes patience and persistence, with only partial successes over the course of decades (witness the experience of developed countries). When effective management instruments are few (as in Yemen), even greater modesty, patience and persistence are required. This is always difficult advice to convey, especially given the enormity and immediacy of the water problem in Yemen.

Most important, the Yemen experience has meant doing and learning and thinking and adjusting simultaneously. There has been vigorous debate within the World Bank on



what can and cannot be learned from the first generation of World Bank-financed water projects, and from the efforts of others. This is an intrinsically difficult process, especially for an institution with high aims and global standards, since it means acknowledging situations that are less than desirable and formulating options that may not be optimum but correspond to the harsh realities of the country.

The second generation of World Bank-financed water projects is now coming on line in Yemen. These are reflected in the Sana'a Basin Water Resources Management Project and Groundwater Management and Conservation Project, both under preparation. Building on the experiences of the first generation activities, they address better integrated management of land and water (through watershed management components), further attention to maximum return per unit of evapotranspiration, development of local capacity for resource management efforts to improve the legal and institutional framework and efforts to selectively improve

the capacity of the national water management agency, especially in information and decision-support systems. Again, the approach will have to be step by step, learning and adjusting as lessons accumulate. But if even partial success can be achieved in the Sana'a Basin, which includes the national capital, this could have a big demonstration effect on the rest of the country.

The water resources challenges of Yemen are an extreme case and shed unusually clear light on some of the central strategic water management questions facing the World Bank. There are few issues relating to major water infrastructure, but many on minor infrastructure, especially on the political economy of water resources management.

Perhaps the greatest challenge for the World Bank is to be realistic about the nature of the challenge and about what change is possible in what time frame. Water management reform ideally derives from underlying factors such as participation and a market economy. While Yemen has made progress in recent

years, it still ranks near the bottom of world tables for these indicators. It is therefore very unlikely in the foreseeable future that the water sector in Yemen will look anything like an ideal Dublin Principles-type water sector.

In such a context how does the World Bank formulate approaches that correspond to reality and not idealized forms of social and political structure? How does the World Bank work with the borrower to formulate achievable (but far from perfect) targets for the next 5, 10 or 20 years? How does the World Bank help staff who are struggling with this massive task, in particular to ensure that the focus is on what is possible and realistic, so that the best does not become the enemy of the good? And how does the World Bank help borrowers pick the low-hanging fruit, an approach that is essential for building confidence and capacity, but that is easy to characterize as inadequate given the magnitude of the challenge?

The Sana'a Basin Water Resources Management Project suggests that the World Bank is approaching these dilemmas seriously and sensibly. The project has been designated as a corporate project, signaling that integrated water resources management approaches in the context of scarce resources and competing claims for the resource can pose serious challenges to governments and to those, like the World Bank, that support them. The learning-by-doing approach adopted in the interventions in Yemen supported by the World Bank reflects the formidable challenges, realizable accomplishments and need to look for solutions beyond the usual blueprints.

Illustration 7: What the new sector Strategy might mean for the World Bank's work on international waters: The Nile Basin Initiative

Since 1996 the Africa Water Resources Management Initiative has sought to improve national water resources management through institutional and legal review and reform efforts, with an emphasis on ownership and stakeholder participation, environmental sustainability, demand management and cost-efficiency. Often, the point of entry

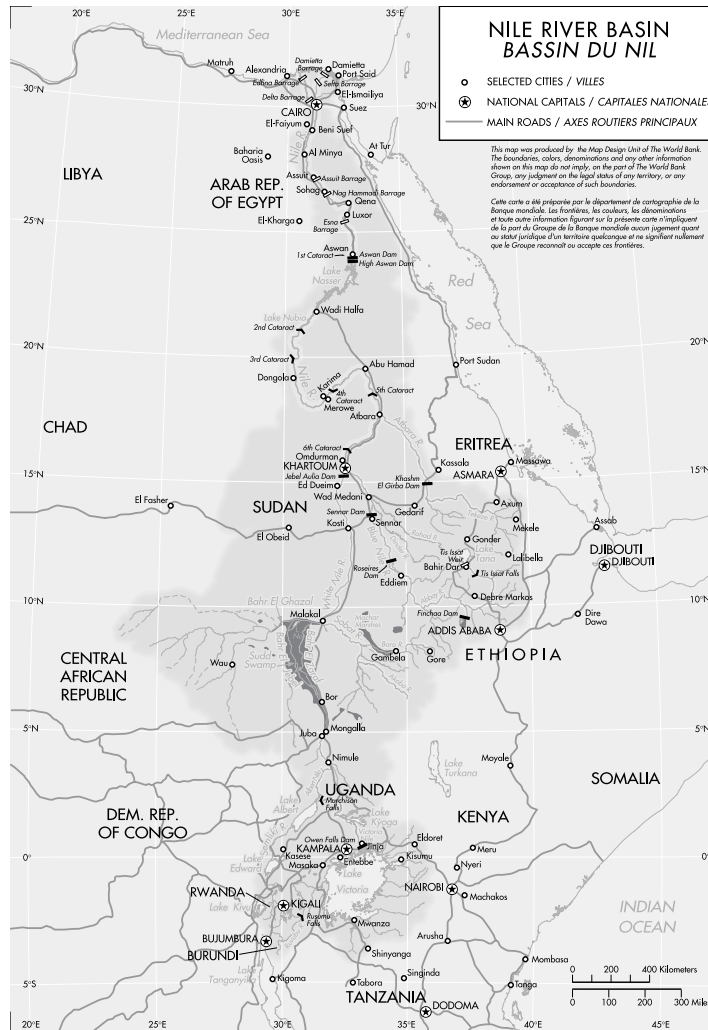
for these reform discussions has been a client's request for major infrastructure investments. Where the scale of perceived investment needs is vast, a review of current practices and options is generally called for. In Africa the need for major water infrastructure investments is great: access to potable water is lower than in any other region, and rainfall variability is roughly three times that in temperate regions but water storage per capita in reservoirs is far below that in developed countries. Water resources management capacity and infrastructure investment levels are low; both must be addressed for either to be truly effective.

An additional complication is that Africa has more international rivers (shared by three or more countries) than any other continent. The World Bank is increasingly asked to facilitate and support cooperative management of international water resources. These requests reflect the World Bank's capacity as a knowledge bank offering global experience in water resources management and its capacity as an investment bank underwriting the investments that will deliver the development benefits of international cooperation.

Tensions over the control of Nile waters (map 4.7) are longstanding obstacles to growth and development in the region. Conflict prevention and cooperative water resources management in the Nile Basin are therefore central development challenges for the 10 countries that share the Nile River.

A clear example of the importance of this Strategy is the Nile Basin Initiative. The initiative is a cross-regional international water resources program supported by the Africa and Middle East and North Africa Regions of the World Bank. The initiative is led by the Council of Ministers of Water Affairs of the Nile Basin States (Nile-COM), supported by a small secretariat in Entebbe. The Nile Basin Initiative's Strategic Action Program is guided by a shared vision "to achieve sustainable socio-economic development through the equitable utilization of, and benefit from, the common Nile Basin water resources." The action program includes a basinwide Shared Vision Program of technical assistance-style projects designed to lay the foundation for cooperative action, and

How does the World Bank focus on what is possible and realistic, so that the best does not become the enemy of the good?



two subbasin investment programs that will promote poverty alleviation, growth and improved environmental management.

At the request of Nile-COM, the World Bank is facilitating discussions among the riparians, backstopping the Nile Basin Initiative’s technical work and coordinating international support for the initiative and the investments it identifies. The World Bank has a comparative advantage in this role because of its strong national-level working relationships with many of the riparian countries, its development focus, its technical capacity, its political

neutrality and, importantly, its capacity to finance cooperative investment programs.

While the overarching goals of the Nile Basin Initiative are conflict prevention, poverty alleviation and environmental management—not simply the construction of major water infrastructure—its mutually agreed projects will deliver the most apparent and immediate development impacts. Should it be difficult for the World Bank to provide this support, for example due to the reputational risks of financing major infrastructure in the Nile Basin, this could un-

dermine the Nile Basin Initiative process. World Bank disengagement from investment could erode riparian confidence that efforts will lead to real development gains, and donor confidence that the Nile Basin Initiative investments are sound. Some projects might find financing without significant donor involvement. It is unlikely, however, that all countries would be able to access funding. Such asymmetric access to finance could increase tensions in the region. Moreover, best practice environmental and social safeguards are more likely to be ensured with the involvement of donor partners.

When the World Bank commits to long-term, high-reward-high-risk undertakings like the Nile Basin Initiative, it is essential that it have a clear institutional mandate to fulfill the range of advisory and investment functions required

When the World Bank commits to long-term, high-reward-high-risk undertakings like the Nile Basin Initiative, it is essential that it have a clear institutional mandate to fulfill the range of functions—in both advisory and investment support—required by such a commitment.

This Strategy maintains an emphasis on the World Bank's knowledge-based support to water resources management and reform, while reconfirming its commitment to support sound, environmentally sustainable and cost-effective investments in water infrastructure. Implementation of the Strategy will strengthen the effectiveness of the World Bank's support to water resources management in the Africa Region—in both its efforts to provide management and institutional support and advice and its efforts to finance infrastructure investments. In practice, institutional support and investment finance are often interlinked in project design and client relations.

Implementing the sector Strategy in the World Bank's operations: What these examples show

The World Bank's activities in water resources in any particular country are the product of three factors: the water resources challenges in the country and the government's approach to them, the overall framework governing the relationship between the country and the World Bank (as embodied in the Country Assistance Strategy) and this sector Strategy. Accord-

ingly, the implications of the Strategy for the World Bank's work in a particular country can only emerge over time, in response to demand from borrowers and as part of a larger relationship.

That said, the examples serve to illustrate how the broad themes of this Strategy are likely to play out in differing contexts. They show:

- On water resources management, the importance of paying explicit attention to:
 - The wide variation in the underlying challenges, from a natural, economic, political and social perspective, and the wide variety of starting points for the appropriate ambition and pace of reform.
 - The need to move away from slogans based on principles and to focus directly on issues of political economy. This means close attention to prioritizing and sequencing reform actions, taking advantage of windows of opportunity thrown open by exogenous economic and political reforms, understanding that the best should not become the enemy of the good and operating with patience and persistence.
 - The need to see water resources reforms through an expansive lens, going well beyond hydrology to the political, social and cultural underpinnings.
 - The need to use the World Bank's comparative advantage, by linking water reforms to broader reforms in governance, civil service reform and financing.
- On the development of water infrastructure:
 - That most developing countries need to invest substantially in water infrastructure.
 - That the appropriate image is not the old one of development first and management later, nor the equally unbalanced management first and development later, but that what is required is a context-specific mix of investments in management and development.
 - That the World Bank must find more effective ways of becoming engaged if it is to have a seat at the table and serve

as a full-service advisory and investment partner to developing countries.

As described above, this Strategy is the third in a trilogy of World Bank statements on water resources management. The first, the 1993 Water Resources Management Policy Paper, outlines the principles governing the World Bank's work in water resources. The second, the 2001 Operations Evaluation Department assessment of experience with implementation of the Policy Paper, concludes that the Policy Paper remains valid and germane, but that the ambition and the pace of implementation must be tailored to the wide variety of circumstances found in the countries that borrow from the World Bank.⁹ This Strategy, the third part of the trilogy, builds on the principles of the 1993 Policy Paper and the lessons of the Operations Evaluations Department study and focuses on how to translate principles into action.

These examples from Brazil, Central Asia, India, Nigeria, the Philippines, Yemen and the Nile Basin underscore the main messages of this Strategy. First, in most developing countries it is necessary to simultaneously improve the management of water resources and invest in developing water resources. Second, even under the best of circumstances, improvement in resource management is a task that is only partially accomplished. It requires patience, persistence, realism and greater attention to the prioritization and sequencing of reforms and their linkage to broader political and economic reform efforts. Third, the World Bank needs to re-engage as a partner in developing high-reward-high-risk water infrastructure through a new approach that focuses primarily on the development risks of not being involved and that leads to more predictable, crisper decisions, without compromising social and environmental standards. Fourth and most important, the examples illustrate graphically that improved water resources management and development are essential for environmentally and socially sustainable growth and for the reduction of poverty.

Notes

1. This assessment is based in part on consultations held with stakeholders in Brasilia in February 2000. The presentations, panel discussions and reports from that meeting are available on www.worldbank.org/water. These consultations were complemented by a discussion in Fortaleza in March of 2001 with senior political, civil service, professional and civil society leaders on the report of the World Commission on Dams.
2. For all other regions, these assessments of what the Strategy might mean are based in part on consultations held with stakeholders in preparation for this Strategy. Due to budget constraints, no consultation was held in Europe and Central Asia.
3. This assessment is based in part on consultations held with stakeholders in New Delhi in May 2000. The presentations, panel discussions and reports from that meeting are available on www.worldbank.org/water.
4. This assessment is based in part on consultations held with stakeholders in Abuja in September 2000. The presentations, panel discussions and reports from that meeting are available on www.worldbank.org/water.
5. This assessment is based in part on consultations held with stakeholders in Manila in February 2000. The presentations, panel discussions and reports from that meeting are available on www.worldbank.org/water.
6. World Bank Operations Evaluation Department. 2002. *Bridging Troubled Waters: Assessing the World Bank Water Resources Strategy*. Washington D.C.
7. Dumol, Mark. 2000. "The Manila Water Concession: A Key Government Official's Diary of the World's Largest Water Privatization." Directions in Development Series, World Bank, Washington D.C.
8. This assessment is based in part on consultations held with stakeholders in Sana'a in September 2000. The presentations, panel discussions and reports from that meeting are available on www.worldbank.org/water.
9. World Bank Operations Evaluation Department. 2002. *Bridging Troubled Waters: Assessing the World Bank Water Resources Strategy*. Washington D.C.

The World Bank needs to move away from slogans based on principles and to focus directly on issues of political economy

ABBREVIATIONS

CAS	Country Assistance Strategy
CGIAR	Consultative Group for International Agricultural Research
GDP	gross domestic product
IDA	International Development Association
IFC	International Finance Corporation
MIGA	Multilateral Investment Guarantee Agency
NGO	nongovernmental organization
OECD	Organisation for Economic Co-operation and Development
PAD	Project Appraisal Document
PRSP	Poverty Reduction Strategy Paper
UNEP	United Nations Environment Programme
WCD	World Commission on Dams

ANNEX 1: THE WORLD BANK POSITION ON THE REPORT OF THE WORLD COMMISSION ON DAMS

December 13, 2001

Dams are important contributors to the development of many countries. They improve and expand power generation, irrigation, and domestic and industrial water supplies, and provide security against droughts and protection from floods. At the same time, they often submerge substantial areas and change the pattern of river flows downstream, causing, in some cases, significant adverse impacts on the environment and local communities.

The World Commission on Dams (WCD) has produced a carefully prepared and well-written Report which has stimulated a wide-ranging and productive discussion of many of the most difficult issues facing developing countries and agencies that work with these countries. The process used by the WCD in preparation of the Report facilitated an unprecedented dialogue between all parties. The Report makes a substantial contribution to addressing the wide-ranging issues surrounding large dams. It presents innovative ideas for dams to contribute more dependably to sustainable development. The World Bank has disseminated the WCD Report widely among its shareholders, and continues to participate in and benefit from the ongoing discussion.

The Report of the WCD advocates:

- Five core values—equity, efficiency, participation, sustainability and accountability—for future decision-making on dams.
- A rights and risks approach for identifying stakeholders in negotiating development choices and agreements.

- Seven strategic priorities—gaining public acceptance, assessing options, addressing existing dams, sustaining rivers and livelihoods, recognizing entitlements and sharing benefits, ensuring compliance, and sharing rivers for peace, development and security.
- A set of criteria for assessing compliance and 26 guidelines for review and approval of projects at five stages of decision-making.

World Bank staff have reviewed the Report thoroughly, and have consulted widely with its Executive Directors, with governments themselves, with nongovernmental organizations, with other international financing institutions and with private financiers and developers. In common with virtually all those consulted, the World Bank shares the WCD core values and concurs with the need to promote the seven strategic priorities.

The focus of much controversy regarding the WCD Report has centered on the 26 “guidelines,” which have been interpreted by some proponents and critics of the Report as a proposed new set of binding standards. The World Bank’s conclusion on the guidelines is best summarized by the Chair of the WCD, who has explained that “our guidelines offer guidance—not a regulatory framework. They are not laws to be obeyed rigidly.... They are guidelines with a small ‘g.’” Individual governments and private sector developers may wish to test the application of some of the WCD guidelines in the context of specific projects. In such cases, the World Bank will work with the government and developer on applying the relevant guidelines in a practical, efficient and timely manner.

The World Bank shares the World Commission on Dams core values and concurs with the need to promote the seven strategic priorities

Support for strategic planning, and a dams planning and management action plan

The World Bank supports its many borrowers that want to continue to learn and improve practice—planning, technical, economic, environmental, and social—in construction and operation of dams. Consistent with the WCD recommendations, the World Bank will support strategic planning processes conducted by borrowers to enhance the evaluation of options and alternatives for energy and water management. The World Bank will also support borrowers in financing sound priority investments emerging from such processes, and will continue to apply its existing policies to these and other projects.

As part of this process, the World Bank has initiated a “Dams Planning and Management Action Plan” to strengthen its work in the water and energy sectors and to improve the evaluation, implementation, and operation of dams when they are the appropriate development option. The Action Plan comprises activities in six complementary areas:

- Working with borrowers to move “upstream,” so that all energy, water supply and flood and drought protection options are assessed.
- Continuing to emphasize institutional reform for more efficient use of water and energy.
- Effectively implementing the World Bank’s existing safeguard policies.
- Continuing to support borrowers in improving the performance of existing dams.
- Practicing a proactive and development-oriented approach to international waters.
- Continuing to support innovative approaches and capacity building for dealing with complex dam-related management and technical issues.

World Bank policies

In reviewing the WCD Report, the World Bank has paid particular attention to the sections that are relevant to World Bank operational policies. In broad outline: there are no

major differences regarding the World Bank’s operational policies on environmental assessment, natural habitats, safety of dams or cultural property; there are limited issues regarding projects on international waterways; there are some issues related to involuntary resettlement and indigenous peoples; and the WCD Report proposes a different framework for project preparation. The following sections outline the differences between the recommendations of the WCD and current World Bank operational policies, and the position of the World Bank regarding the recommendations.

On the project preparation and consultation process

The WCD Report recommends a multi-stage process including the following steps: the location, scope and design of the project is determined based on an agreement by all stakeholders; a stakeholder forum assesses alternatives for the detailed layout of the dam; cumulative and interactive aspects of existing infrastructure on the river are addressed in the design of the dam through an agreement reached with the stakeholders and operators; final design includes provisions for emergency preparedness and decommissioning; mitigation, resettlement, monitoring and development plans are agreed with affected groups and signed as “contracts” with them; performance bonds are secured, trust funds established and integrity pacts signed before project implementation starts; and licensing to construct and operate the dam is conditional on satisfactory implementation of agreed mitigation and development plans.

The World Bank remains committed to implementation of its operational policies to ensure that: key stakeholders are systematically identified and involved in project planning and implementation; meaningful upstream consultations are held with affected groups to guide project decision-making, and their views and preferences are reflected in the plans developed as an integral part of the project. The implementation of mitigation and development plans is funded as an integral part of the project budget and regularly monitored, both by the Borrower and the World Bank. The World

The World Bank agrees with the Chair of the WCD that the 26 WCD guidelines “offer guidance—not a regulatory framework. They are not laws to be obeyed rigidly....They are guidelines with a small ‘g’”

Bank notes that in both developed and developing countries the state has the right to make decisions that it regards as being in the best interest of the community as a whole, and to determine the use of natural resources based on national priorities.

On involuntary resettlement

The WCD Report recommends that: all adversely affected people negotiate formal and legally enforceable mitigation plans (in cases where negotiations stall, an independent dispute resolution process is required); any outstanding resettlement issues associated with existing large dams on the same river be identified and remedied before new infrastructure is built; adversely affected people be recognized as first among the beneficiaries of the project, and mutually agreed and legally protected benefit sharing mechanisms negotiated to ensure implementation; a clear agreement with the affected people be reached on the sequence and stages of resettlement before construction on any project preparatory works begins; compliance plans be enforced through independent review; and the license to construct and operate the dam include conditions related to successful completion of resettlement, mitigation and development plans.

The World Bank's resettlement policy is built on the principle of informed participation of affected people in resettlement planning and implementation, but does not require the negotiation of development and mitigation plans. This approach ensures that affected people are assisted in their efforts to improve, or at least restore, their standards of living, in a manner that is consistent with their cultural preferences, while retaining the rights of the state to exercise eminent domain for the larger public interest as appropriate in the circumstances. The World Bank has been and remains committed to seeing that thorough baseline studies are conducted to identify affected people and the extent of impacts. Its operational policies require that affected people are provided opportunities to participate in resettlement planning and implementation, and draft plans are disclosed in the project area to obtain the views of affected people before they

are finalized. Implementation of the agreed mitigation and development plans is reflected in the legal agreements between the World Bank and the Borrower.

Resettlement implementation is monitored by the Borrower and the World Bank, and "independent panels" are increasingly engaged in projects with major resettlement impacts. The recently approved World Bank operational policy on involuntary resettlement also requires an early review of resettlement implementation to use the lessons learned for subsequent implementation. World Bank-financed projects are not considered complete until agreed plans are fully implemented, and follow-up surveys are conducted at project completion to document the extent to which the incomes and standards of living of affected people have been restored. The findings of these surveys form the basis of discussion on follow-up measures, as necessary, with the Borrower. A chapter of the forthcoming World Bank resettlement sourcebook will describe good-practice elements of reservoir resettlement, drawing on, among other sources, the extensive knowledge base compiled by the WCD.

In the past the World Bank has, when requested by the Borrower, supported actions to resolve outstanding resettlement (and other social and environmental) issues from past projects. The World Bank is also willing to assist Borrowers in developing their national, regional or sectoral social and environmental policies and legal frameworks.

On indigenous peoples

The WCD Report proposes that indigenous and tribal peoples should give their free, prior and informed consent to the project.

The World Bank requires that free and meaningful consultations with directly affected indigenous groups be undertaken prior to the initiation of detailed project preparation, and the draft operational policy on indigenous peoples requires that the World Bank and the Borrower take into account the results of such consultations in deciding whether to proceed with the project. Where the World Bank decides to proceed

The World Bank's resettlement policy is built on the principle of informed participation of affected people in resettlement planning and implementation, but does not require the negotiation of development and mitigation plans

The World Bank is dedicated to ensuring that the views of indigenous people are taken into account by project decision-makers, without infringing on the right of the state to make decisions in the best interests of the community as a whole

with project processing, mechanisms are established to ensure the informed participation of indigenous peoples in project preparation and implementation. If indigenous peoples are likely to be adversely affected by the project, the Borrower is required to conduct a social assessment to help assess the scope and extent of adverse impacts, and to discuss proposals to avoid, or minimize and mitigate them.

Indigenous Peoples Development Plans are prepared to help mitigate adverse impacts and to promote tailoring of benefits based on the preferences of the people concerned. Such plans are reflected in the legal agreements between the Borrower and the World Bank. The World Bank is thus dedicated to ensuring that the views of the affected people are carefully documented and taken into account by project decision-makers, without infringing on the right of the state to make decisions which it judges to be the best solution for the community as a whole.

On projects on international waterways

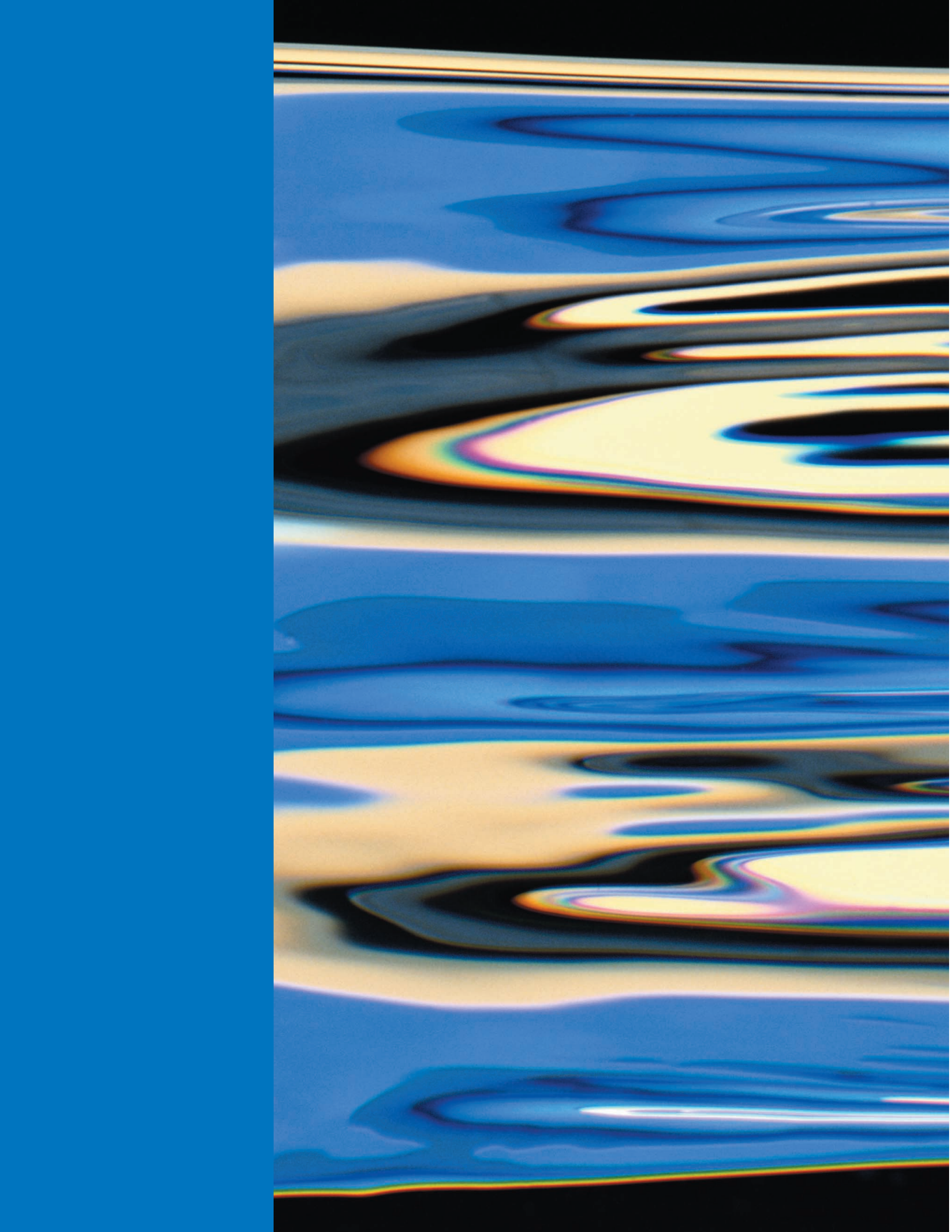
The WCD recommends that where a government agency plans or facilitates the construction of a dam on a shared river in contravention of the principle of good faith negotiations between riparians, external financing bodies withdraw their support for projects and programs promoted by that agency.

The scope of the World Bank's policy for projects on international waterways is not as broad as the recommendation of the WCD in this regard. Except in specified circumstances, the World Bank policy does not allow financing of a project on an international waterway until all the riparians are notified of

the project and have voiced no objection. If there is an objection from one of the riparians, then World Bank staff assess and confirm that the project will not cause appreciable harm to the interests of the other riparians. The World Bank may in appropriate cases appoint one or more independent experts to examine the project details and submit a technical opinion thereon. However, the World Bank considers a blanket prohibition on work with an agency that has built a dam in contravention of good faith negotiations to be too broad and to foreclose many opportunities for productive collaboration. The World Bank has been and remains committed, in accordance with the main objective of its operational policy on projects on international waterways, to taking a proactive role in supporting riparians to make appropriate agreements or arrangements for sharing and managing the entire waterway or any part thereof.

Summary

The World Bank considers the WCD Report to be a major contribution in defining the issues associated with large infrastructure in developing countries, and in engaging a wide variety of stakeholders in the debate. The World Bank is committed to continued support for its borrowers in developing and managing priority hydraulic infrastructure in an environmentally and socially sustainable manner, and views the WCD Report as a significant point of reference in this process. The World Bank intends to continue to work with its borrowers in effective implementation of current World Bank operational policies, which the WCD describes as "...the most sophisticated set of policies, operational procedures and guidelines amongst the international donor community."





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