

# Water Resources Sector Strategy:

## Strategic Directions for World Bank Engagement

February 2003



# Contents

<b>Overview and Executive Summary.....</b>	<b>v</b>
Progress in ideas and practice .....	v
Scope and methodology of this Strategy.....	vi
The main messages of this Strategy.....	vi
<b>I: Introduction and Development Context.....</b>	<b>1</b>
The gloomy arithmetic of water .....	1
Water resources management and development are critical for achievement of the World Bank’s strategic objectives of sustainable economic growth and poverty reduction.....	2
The World Bank’s borrowers face a wide range of water development and management challenges .....	9
Water management must make a series of important transitions.....	9
The scope of this Strategy.....	11
Key strategic issues in the main water-using sectors .....	12
Pricing and water rights: principled pragmatism.....	22
<b>II: Stocktaking and Evaluation.....</b>	<b>28</b>
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 .....	29
The 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.....	39
The World Bank position on the “Guidelines” of the World Commission on Dams .....	40
The comparative advantage of the World Bank, and the need for revising business practices .....	41
<b>III: Strategic Options and Possible Business Implications .....</b>	<b>43</b>
The additionality and focus of this Strategy.....	43
Developing a portfolio of analytic work which informs management decisions and recognizes differences .....	45
Working with partners .....	45
Finding new sources of financing for water resources infrastructure .....	46
Dealing with risk and developing a more effective business model .....	49
How the World Bank is organized and staffed .....	54
<b>IV: What the Strategy Might Mean for World Bank Engagement: Some Illustrative Examples from Different Regions .....</b>	<b>59</b>
<b>Acronyms.....</b>	<b>84</b>
<b>Annex: The World Bank Position on the Report of the World Commission on Dams.....</b>	<b>85</b>
<b>Endnotes and Bibliography.....</b>	<b>90</b>



## 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)<sup>1</sup>. 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 process. This consensus stated that modern water resources management should be based on three fundamental principles (known as “the Dublin Principles”). First there is the *ecological principle*, which argues that independent management of water by different water-using sectors is not appropriate, that the river basin must become 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 OECD) has concluded that progress in implementation has been difficult, slow and uneven and that even the most advanced countries are very far from full compliance with the Dublin Principles. Third, another review (by the 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 sanitation, irrigation and drainage and hydropower) are, in accordance with the subsidiarity principle, determined primarily as part of the strategies for these respective 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 the focus of the Strategy is on implementation, the preparation process 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 (fourteen 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 a number of 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 no particular barriers to Bank engagement with these issues, there are no major changes of course 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 Paper.

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 paper 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 is 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 inter-basin transfers, provide national, regional, and local benefits from which all people, including the poor, can gain. Second, because it is usually the poor who inhabit degraded

landscapes, poverty-targeted water resources interventions designed to improve catchment quality and provide livelihoods for the poor 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 the poor. 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 of these 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 both in 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, 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, but recognizes 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. Inter alia this will mean recognizing that solutions have to be tailored to specific, widely-varying, circumstances, and that the art of reform is in picking the low-hanging fruit first, not making the best the enemy of the good, recognizing broader reforms outside of the water sector (often relating to overall economic liberalization, fiscal and political reform), providing the pre-conditions for improving resource and service management, and 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 why industrialized countries have invested in major hydraulic infrastructure such as dams, canals, dykes and inter-basin transfer schemes. Many developing countries have as little as 1/100<sup>th</sup> 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 of available hydropower potential. 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 non-lending services related to water resources development and management. The ability of the Bank to respond has been mixed. On the one hand, on the very important “soft” side Bank engagement is growing, rapidly and effectively. On the other hand, for the many countries that need to make major infrastructure investments to complement

management reforms, the Bank often become 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 IFC, puts development impact first; assesses the development impact of both engagement and non-engagement by the Bank; considers the rights and risks of those directly and indirectly affected by such projects; meets social and environmental standards; treats those 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 terms of performance and knowledge, 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 MIGA play an indispensable role in attracting much-needed investment by the private sector. 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 particular, the Bank must be engaged in a full range of water infrastructure and management activities in countries which 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 (CAS) and Poverty Reduction Strategy Papers (PRSPs).** 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 any particular country (or Region) at any 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 of “Country Water Resources Assistance Strategies” (CWRASs) which will pull together three different strands. The first strand is the specific water resources challenges and development opportunities in a particular country at a particular point of time. The second strand is the framework which the government and the World Bank have agreed upon for the next three years. The third and final strand contains the broad principles articulated in the World Bank’s 1993 WRMPP, and in this Strategy. The resulting CWRAS will provide an explicit program of Bank lending and non-lending support in water, which will be consistent with the PRSP (and the CAS) and which will govern the Bank-country partnership in water for the next three years.



## I: INTRODUCTION AND DEVELOPMENT CONTEXT

### *The gloomy arithmetic of water*

1. The World Commission on Water has described the “gloomy arithmetic of water.”<sup>2</sup> During the past century, while world population tripled, the aggregate use of water increased six fold. Irrigation, industry and municipal use account for, respectively, 70 percent, 20 percent and 10 percent of global water withdrawals. These increases have 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. It is estimated that 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.

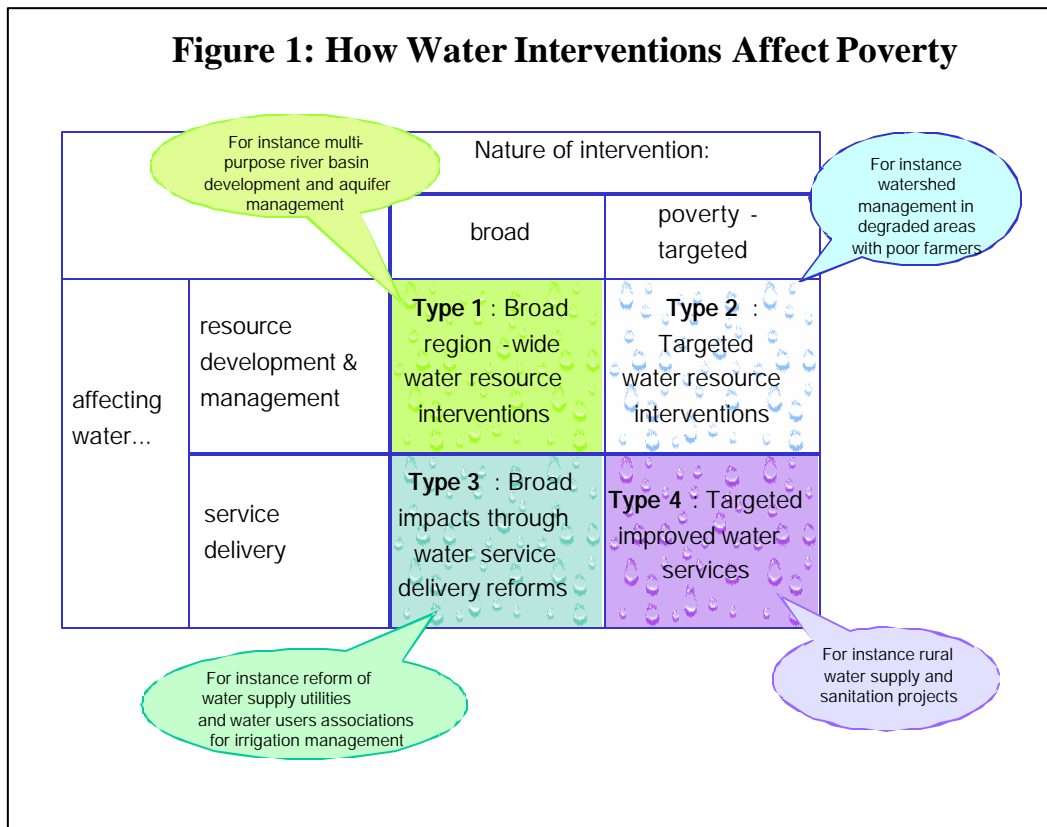
2. This gloomy arithmetic of water is mirrored in the gloomy arithmetic of costs. While low-cost, often community-based solutions can and should be further exploited, the “easy and cheap” options for mobilizing additional major sources of supply for human needs have mostly been exploited. Many countries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

3. 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.

4. 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 for achievement of the World Bank's strategic objectives of sustainable economic growth and poverty reduction***

5. 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 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 that extend to all, including the poor. Type 2 interventions improve water resources management (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 which affect the development and management of water *resources***

6. 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 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 - and hence output - 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 climatic variability also incur large opportunity costs in adapting to the effects of water-induced shocks on their economies.

7. 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<sup>3</sup>; the recent floods in Mozambique led to a 23 percent reduction in GDP<sup>4</sup>, and the drought of 2000 in Brazil to a halving of projected economic growth<sup>5</sup>. As articulated by a finance minister for India, “every one of my budgets was a gamble on rain.”<sup>6</sup>

8. An obvious and historic response to this variation is to mitigate the effects of rainfall variability 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 natural 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<sup>7</sup>.

9. Major water resources projects often form the basis for broad regional development, with significant direct and indirect benefits for the poor (and others). Major water development projects in Brazil<sup>8</sup>, India<sup>9</sup>, Malaysia<sup>10</sup> and the United States<sup>11</sup> show large direct benefits (from irrigation and hydropower) and indirect benefits that are typically twice as large. In many cases the poor 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<sup>12</sup>. Similarly in India, water infrastructure has evened out the seasonal demand for labor, resulting in major gains for the poor<sup>13</sup>. 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.”<sup>14</sup> 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 this drops to only 26 percent.<sup>15</sup>

10. Changes in policies similarly have a substantial impact on opportunities for the poor. For example, in 1992 Mexico passed a new water law, which introduced radical changes in the way in which water is managed. Of highest importance were 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 the poor)<sup>16</sup>.

11. 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 Egypt, Mexico, Northeast Brazil, 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<sup>17</sup>. So too do the poor generally benefit from these systemic growth-inducing investments in water resources management and infrastructure. The appropriate image is not “trickle down” but “a rising tide lifts all boats.”

12. The importance of water development as a source of growth-oriented sustainable poverty alleviation was highlighted at the recent World Summit on Sustainable Development (WSSD). The official declaration of the Summit emphasizes the role which 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<sup>18</sup>.

13. 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 for considering structural and non-structural alternatives, there has been a rush to build 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 a particular and vital group of poor people, namely those who had to be resettled and those who were adversely affected by the 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 in the past 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.

14. 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 Treaty 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,” which, under certain circumstances, can be a powerful catalyst for broader cooperation, growth and security. These broad benefits do not bypass the poor; on the

contrary, it is the poor who are most vulnerable to insecurity and, accordingly, 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 which affect the development and management of water resources***

15. 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. On the one hand, there is growing evidence that the services provided by hydraulic infrastructure are dependent on the way in which land is managed in the catchment. On the other hand, 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—which focus on land and water management activities that simultaneously increase the livelihoods of the poor (who comprise a large proportion of the population living in these degraded environments) and improve the quality of the land and water resources.

16. 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 NGO-led watershed management projects. The project aims at simultaneously reducing erosion, increasing groundwater recharge and improving the livelihood of the poor. The major investments are in terracing, 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 high levels of salinity. The project organizes groups of landless farmers into small cooperatives and provides technology and advice on land reclamation. A remarkable 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.

17. An interesting variant, stimulated by the recognition of dam owners that upper catchment management is imperative for maintaining the value of their assets, is cooperative watershed management. Thus, for example, the proposed Nam Theun 2 Hydropower Project in Laos provides support for communities to improve the management of the catchment. Similarly, private companies that operate the water concessions in Manila are investing heavily in catchment management to preserve the quality and quantity of the water on which the city depends<sup>19</sup>.

18. Finally, early efforts at better management of ecological flows from dams have had impressive results for the poor. Fishermen 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<sup>20</sup>.

19. The bottom line is that there are (as highlighted in the World Bank's recent Environment Strategy<sup>21</sup>) many opportunities for simultaneously improving resource management and improving the lives of the poor. 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 which affect the development and management of water services***

20. Abundant evidence shows that the poor suffer most when water services (water supply, irrigation and hydroelectric power) are managed poorly<sup>22</sup>. In city after city in the developing world the unserved poor pay ten or more times the price for a liter of water than is paid by their fellow citizens who are served with formal supplies. The corollary is that the poor 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 1.5 million more people (most of them poor) now have access to piped water and 600,000 more people (most of them poor) now have access to sewerage connections<sup>23</sup>. In a word, water utility reform usually means substantial benefits for the poor. An important element of the overall impact on the poor is the impact on poor women. In most countries it is women who fetch and carry water, and they who suffer disproportionately when services are poor. Because of this gender reality, women can and should play a central role in programs that address the water and sanitation needs of the poor.

21. 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 the poor. Thus in the Liuduzhai Project in the Yangtze Basin in China, for example, the introduction of water users' associations has led to greater transparency, lower costs and better and more services to the poor<sup>24</sup>. Other cases suggest more complex but equally important pathways through which the poor benefit from broad reforms in irrigation management. A particularly interesting case is that of 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 anti-poor 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 sub-contractors to these farmers. Second, the poor farmers benefited by finding employment in the industries that grew up for supplying inputs and for processing the products of this now-dynamic agricultural sector<sup>25</sup>. The key conclusion is that water infrastructure and market-oriented reforms (which are often decried as “anti-poor”) can, when well-designed, be the basis for growth and opportunities for the poor.

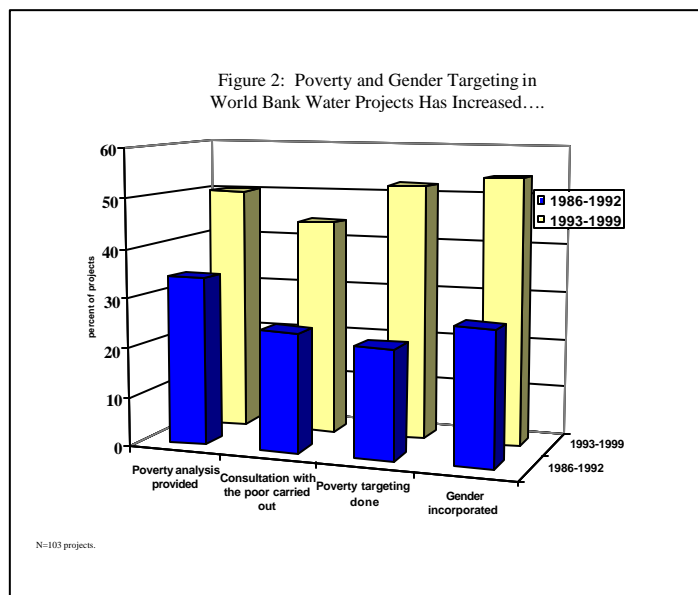
**Type 4 Interventions: Poverty-targeted policies and investments which affect the development and management of water services**

22. This is 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 the poor) typically pay ten times more for a cubic meter of water than do those who receive formal services (always the better off)<sup>26</sup>. 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 the poor.

**Summary on water resources and poverty**

23. There are several main observations. First, water resources management policies and investments affect the poor in a variety of direct and indirect ways, most of which are important in most contexts. Second, there has been substantial improvement in the way in which Bank-financed water projects directly address poverty and social concerns, as shown in Figure 2 from the recent review by the Operations Evaluation Department (OED)<sup>27</sup>. Third, 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.

Fourth, 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). Fifth, there are distributional distinctions between the poverty impact of rehabilitation (which benefits those who benefited from the initial investments) and new projects (where new people benefit and which are, *ceteris paribus*, more equitable).



24. 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 the poor (Type 1 benefit);

- ⌘ Have components that aim at improving watershed management, with associated benefits for the poor 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 the poor and especially poor women benefit (Type 3 benefit); and
- ⌘ Provide targeted benefits to the poor 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).

25. One important task is to develop guidelines for translating 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 (CWRASs). The Water Resources Management Group (WRMG), which brings together the regional and sectoral leadership on water across the Bank, has started this work. This will include: “mapping down” to ensure that macro actions benefit the poor, both directly and indirectly; “mapping up” to assess the broader implications and sustainability of local water actions; and integration to ensure that there is consistency and synergy across the four types illustrated in Figure 1.

26. Finally, water resources management is directly relevant to several of the international development targets set by the UN Millennium Assembly in October 2000, as shown below.

**Table 1: Water Resources Management and the Millennium Development Goals**

<b>Target # and description</b>	<b>Relevant water interventions (from Figure 1)</b>
<b>Target 1</b> , which aims at reducing the proportion of people whose income is less than one dollar a day.	<b>Types 1 and 2</b> , through their contribution to overall and targeted economic growth; <b>Types 3 and 4</b> , through better general and targeted growth-inducing services.
<b>Target 2</b> , which aims at reducing the proportion of people who suffer from hunger.	<b>Types 1 and 2</b> , through their contribution to overall and targeted economic growth, food production and hunger reduction; <b>Types 3 and 4</b> , through better general and targeted growth-inducing and food-producing services.
<b>Target 5</b> , which aims at reducing the under-five mortality rate.	<b>Types 1 and 2</b> , through their contribution to overall and targeted economic growth and thus mortality reductions; <b>Types 3 and 4</b> , 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.
<b>Target 9</b> , 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 Sector Strategy focuses on how to make these principles effective in country policies and programs.
<b>Target 10</b> , which aims at reducing the proportion of people without sustainable access to safe drinking water.	<b>Types 1 and 2</b> , through their contribution to overall and targeted economic growth and thus demand and willingness to pay for better services; <b>Types 3 and 4</b> , through better general and targeted water supply services.



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

27. 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" principles<sup>28</sup> provide a compass, but the details have to be tailored to the historical, cultural, environmental, social, economic and political circumstances of each particular country.

28. 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<sup>29</sup>. 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<sup>30</sup>.

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 constraints, and the dependence of over 35 million people on 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 climatic variability. Whereas Australia has 5,000 cubic meters of water storage capacity per person, Ethiopia has 45 cubic meters<sup>31</sup>. The United States and Nepal have roughly equivalent economically-exploitable hydropower potential. Whereas installed hydropower capacity in the United States is about 70,000 MW; in Nepal it is less than 600 MW<sup>32</sup>.

## *Water management must make a series of important transitions*

30. In meeting these water resources challenges, a series of transitions is underway which has major implications for water management.

⚡ **From development or management to development *and* management.** For decades water resources management was equated with the building 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 being unnecessary and destructive. The emerging view is that both of these 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.

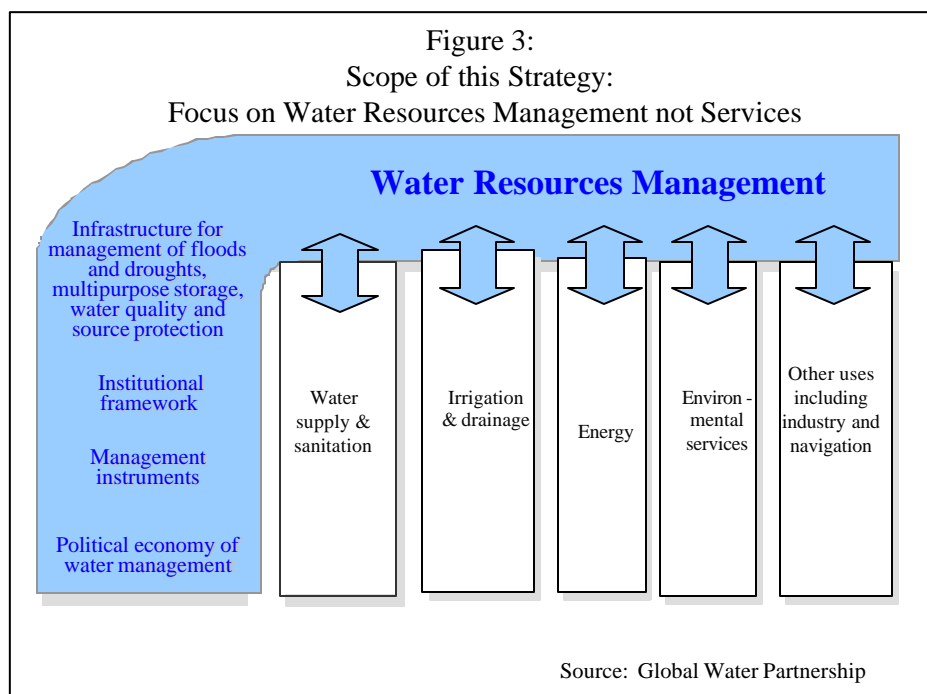
⚡ **From local to regional and international management.** Water management is moving from being just a local issue to a national issue, and from a national to an

international one, 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 that there is a greater need for consensual mechanisms (from the local to the international level) for dispute resolution, and for the development of flexible, voluntary methods for reallocating water in response to changing demands and values. Water could become a cause of conflict; alternatively it could become a major catalyst for cooperation at all levels—and even economic integration. Experience has shown that cooperative programs for water resources management have played an important role in regional integration and stability in Eastern Europe (the Baltic Sea), Southeast Asia (Thailand and Laos), South Asia (the Indus Basin) and Southern Africa (Lesotho Highlands).
- ⌘ **Towards public-private partnerships.** Much of the necessary hydraulic infrastructure is multi-functional (such as reservoirs which generate electricity and provide protection from floods). Financing of 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 is 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 of particular importance, and necessarily a major focus for institutions like the World Bank.

## The scope of this Strategy

31. Water management can be conceptualized as a “comb” (Figure 3<sup>33</sup>), in which the “teeth” are the water-using sectors and the “handle” is the resource itself, defined by its location, quantity and quality.



32. This Strategy does not focus on the water-using sectors (which are addressed in other World Bank sector and business strategies,<sup>1</sup> 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 of laws, rights and licenses; the responsibilities of different actors; and standards for water quality and service provision (especially to the poor), for the environment, for land use management and for the construction and management of infrastructure that affects the quantity and quality of water resources; at levels ranging from local watershed management institutions to international basin agencies;
- ⌘ **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;

<sup>1</sup> 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.

- ⌘ **The development and management of infrastructure** for annual and multi-year flow regulation, for floods and droughts, for multi-purpose storage, and for water quality and source protection; and
- ⌘ **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*

33. It is obvious from Figure 3 that there is a 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 this Strategy.

34. 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 sector have a profound influence on the ways in which societies approach the challenges of water management. When specific water-using sectors play a dominant quantitative role in the use of resources, a strategy for resource management must examine more closely the internal workings of such sectors. Although World Bank approaches for the 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, and implications for, the management of water resources.

### **Irrigation and drainage and water resources management**

35. 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 by 30 percent, and average daily caloric intake increased from 2000 to 2800. 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<sup>34</sup>.

36. 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 twenty years earlier), the World Bank remains a major actor both directly and through key partnerships, including the Consultative Group for International Agricultural Research (CGIAR).

37. The Rural Board has decided to develop 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 FY 2003. While respecting the principle of subsidiarity, and without preempting the upcoming Irrigation and Drainage Business Plan, this section outlines the challenges

facing the irrigation and drainage sector in some detail because there is no other water-using sector in which the relationship between the sector and overall water resources management is 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 all water use in developing countries<sup>35</sup>. 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 impacted wetlands, fisheries, coastal and marine ecosystems, and the populations that depend on these; 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, 70s and 80s (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; clarifies the public roles (legal framework and regulation) and private (profit and non-profit) roles for service delivery; and
- ⌘ Articulating sound, achievable, sequenced approaches to cost recovery for different components of irrigation and drainage systems.

38. 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 the World Bank has historically played in irrigation, and because of its ability to access and integrate the wide range of institutional and technical skills required.

39. Drawing on a broad basis of sector work, OED reports and external assessments, the World Bank is in the process of formulating a new strategic approach to the irrigation and drainage sector, with fundamental implications both “on the farm” and for the management of water resources.

40. 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 crop and cash and jobs per drop) through a combination of means—economic, institutional, agronomic (cropping patterns, intensification), hydrological (reducing non-beneficial 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, the costs of servicing debt for 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<sup>36</sup>. As discussed in more detail later in this report, 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 users’ associations (WUAs) empower users to operate and maintain their systems, collect fees, hire professionals and manage water rights. They have proved to be an effective means 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 some gains from WUAs it has also become clear that irrigation reform has to be fully supported by institutional reform. If the agencies themselves are not modernized, then users’ 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 factors 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; 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 in India.

≍ **Supporting partnerships which 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, which result in more production per unit of consumptive water use, which are less vulnerable to pests and spoilage and which use smaller quantities of water-polluting fertilizers and pesticides.

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

≍ **Greater attention to basin-wide 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 frequently another farmer's recharge, and improved farm-level irrigation efficiencies often result in only paper, not real, water savings. What is required is 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 or 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 non-beneficial 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 essential for management of irrigation systems as well as river basins or aquifers. In doing this it is first necessary to clarify that in most countries 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 these latter 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. On the other hand, there has been substantial progress in recent years (in Chile, Mexico, Brazil, 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<sup>37</sup>. The World Bank is starting to accumulate 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 drilling wells and for the pumps and irrigation systems. In many countries, however, these 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 overexploitation of groundwater. It is estimated that 10 percent of the world’s food supply is based on the unsustainable pumping of groundwater<sup>38</sup>. 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)<sup>39</sup>.

42. In summary, the irrigation and drainage sector in many developing countries 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 through mobilizing additional land and water resources (as was done in the past), but by getting more out of less—more crop, dollars 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 it 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 Strategy.

### **Energy and water resources management**

43. There is now a broad consensus—exemplified in the World Bank’s recent Energy Sector Business Strategy—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 that of legislation, regulation and planning (the vital role for the state). The Energy Sector Business Strategy<sup>40</sup> emphasizes issues such as: stimulating competition among energy suppliers; developing and strengthening objective, transparent regulation; commercial pricing and enterprise viability; and expanded private sector participation. The Energy Sector Business Strategy also articulates a role for the World Bank, the 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.

44. 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 (and in particular 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.<sup>41</sup>) It also means that the owners of dams have increasingly realized that substantial amounts of storage (between 0.5 and 1.0 per cent globally) are lost each year due to sedimentation, and that sediment management in both catchments and dams is vital in 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 (WCD<sup>42</sup>). 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.

45. World Bank and IFC experience has confirmed that hydropower projects offer particular windows for improving social and environmental performance. In countries such as Brazil and China this means building on strong domestic capacity and experience; in poor countries (such as Laos and Uganda) it means using strong external private sector developers as a means for advancing good practice and developing local capacity.

46. A recent and important development is the formal recognition, at the WSSD, that hydropower (large and small) is a renewable source of energy and that, in the words of the WSSD Implementation Plan<sup>43</sup>, there is “a sense of urgency, [to] substantially increase the global share of renewable energy sources...” This should foster emerging mechanisms whereby environmentally and socially sustainable hydropower (small and large) can benefit from the nascent trading in carbon permits. Among the first activities of the Prototype Carbon Fund are two transactions to purchase emissions 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<sup>44</sup>.

47. Finally, a specific but very important implication for water management is that a “modern” energy sector should not provide large hidden subsidies for the pumping of groundwater, one of the most environmentally destructive of perverse subsidies. Experience

has shown that this is a particularly difficult and political area, in which 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<sup>45</sup>.

### **Water supply and sanitation, and water resources management**

48. 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 providers (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 Strategy (to be finalized in FY 2003) has only just started, it is possible to broadly identify priority policies and approaches to their implementation within the water and sanitation sector, and describe how these relate to the management of water resources.

49. An overriding thrust of the World Bank's work on water and sanitation is to ensure that the poor 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 preferences of poor communities in terms of 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 regarding their participation, service levels and service delivery mechanisms; realigning rights and obligations of key stakeholders; vesting communities with ownership rights and authority to select service providers; building local capacity to support community decision-making 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 which are practical in each cultural setting, play the major role that is commensurate with their knowledge of, and interest in improving, local water services.

50. 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 creditworthiness of water providers to enhance capacity to mobilize financing for long delayed investments in rehabilitation, upgrading and expansion; gradually raising average tariffs to cost reflective levels and instituting predictable, transparent adjustment mechanisms; eliminating generalized supply-side subsidies in favor of those narrowly targeted to achieving specified outcomes and to serving 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.

51. An important change in World Bank practice in recent years has been supplementing the traditional support for accountable, public sector utilities with support for private sector involvement in the provision of water and sanitation services. Over the past decade the World Bank has increased its funding to a point where about 40 percent of projects it finances involve some form of private sector participation<sup>46</sup>. This has been motivated by several factors. First, while some public utilities have managed to maintain high performance for protracted periods, few poorly-performing public utilities have “bootstrapped” themselves up to achieve sustained good performance. Second, the entry of the private sector, 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, this 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, utility-wide capacity through sponsorship of the International Network of Utility Regulators<sup>47</sup>. Fourth and most fundamental, is the concern with finding better mechanisms for getting cost-effective, accountable services to the billions 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 for the foreseeable future will provide, water to the vast majority of people in developing countries. Accordingly the World Bank does and will continue to devote attention and resources to helping improve the performance of public utilities.

52. Experience shows that these changes in the water and sanitation sector have several profound implications for the management of water resources. First, accountable utilities (public and private alike) are acutely aware that the service they provide depends on the availability of a reliable quantity of good quality raw water<sup>48</sup>. 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<sup>49</sup>. 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 the 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.

53. 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 disposal<sup>50</sup>) and in part due to more aggressive advocacy by the World Bank, the “dirty water” side is becoming a much more prominent feature of the World Bank’s work in the sector. The WSSD has also added sanitation to the Millennium Development Goals. Here the key issues are the sequencing of on-site and off-site investment, the simultaneous consideration of the costs incurred and 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,

this requires close coordination 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 which are separated from the implicit or explicit regulatory apparatus, and which are accountable for their performance, engage actively in helping to devise sensible, sequenced strategies for improvement.

54. 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 the better water utilities have, out of enlightened self-interest, become major change agents, assuming a progressive role as advocates for better water resources stewardship in many instances.

### **Environmental services and water resources management**

55. 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 all 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. These environmental services include the following:

- ⌘ **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<sup>51</sup>, Rural<sup>52</sup> and Forest<sup>53</sup> 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, 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 increasingly 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, both 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 WCD<sup>54</sup> has correctly stressed that the rights of “downstream ecosystems and people” have historically been ignored. Here, too, new forms of practice are evolving, with maintenance of ecological flows now becoming an issue addressed in the design of new infrastructure, and in re-calibrating of operating

rules in river basins. The World Bank is actively engaged in bringing best practice to bear, through knowledge generation, through partnerships and through its operations.

56. An “environment issue” of major relevance to water resources management is climate change. The effect of climate change on streamflow and groundwater recharge varies regionally and between climate scenarios. A consistent projection across most climate change scenarios is for increases in annual mean streamflow in high latitudes and Southeast Asia, and decreases in Central Asia, the area around the Mediterranean, Southern Africa, and Australia, although the amount of increase or decrease varies between scenarios. For other areas, including mid-latitudes, there is no strong consistency in projections of streamflow, 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 is 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 lead to an increase in the variability of Asian summer monsoon precipitation<sup>55</sup>.

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

58. Developing countries face three major challenges. The first challenge is that many developing countries have stocks of water infrastructure that are orders of magnitude smaller than those of climatically-similar industrialized countries. There are, accordingly, major needs in developing countries 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 WCD). The second challenge for developing countries is to invest simultaneously and heavily in non-structural management solutions. Most developing countries have understood this and are now doing so (such efforts range from the massive efforts at watershed management 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.

59. While climate change has profound implications for water resources management, the reverse is also true: how water is managed can play a role in stabilization of 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<sup>56</sup>. While about 70 percent of hydropower potential in Europe and North America is already tapped, in Asia, Latin America and Africa, only 20 percent, 15 percent and 5 percent, respectively, has been developed<sup>57</sup>. As shown in the WCD background paper on dams and climate change<sup>58</sup>, greenhouse gas emissions from most hydropower plants are relatively low, with the one important exception being large flat lakes in heavily-vegetated tropical areas.

60. The Implementation Plan from the WSSD firmly establishes hydropower (small and large) as a renewable source of energy, the production of which should be stimulated. Given the considerable untapped hydropower potential in many developing countries, the World Bank should actively support the development of small and large hydropower, ensuring, of course, that this is the most appropriate option and that good environmental and social practices are followed. Finally, this recognition by the WSSD 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 (with small hydropower plants) has been made by the Prototype Carbon Fund.

### *Pricing and water rights: principled pragmatism*

61. Many countries face multiple concerns regarding the growing scarcity of water, the 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 that the situation is considerably more complex and nuanced, and that it is not enough to just extol the virtues of pricing. This section outlines a different approach – one of “principled pragmatism”. “Principled” because economic principles such as ensuring that users take financial and resource costs into account when using water, are very important. 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 implications of these distinctions for practice;
- ⌘ 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; and
- ⌘ 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 One: The radically different markets in which irrigation and urban water operate**

62. The first, fundamental distinction is between the markets in which urban water supply and irrigation operate.

63. In the case of urban water supply the product can largely be considered as a local, non-tradable 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 is of no relevance to water users in Timbuktu.

64. In the case of irrigation, where the end products are agricultural goods that trade on a global market, the situation is radically different. If the government of a developed country chooses to subsidize water (and other inputs and outputs) of its farmers, this has an impact on world prices, and thus a direct impact on producers in developing countries. Since the magnitude of the agricultural subsidies from OECD countries is huge (about \$350 billion/year<sup>59</sup>, to the detriment of consumers in developed countries and producers in developing countries), 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 both the economy and the environment.

65. 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 example<sup>60</sup>—for the government and farmers to agree upon 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 Two: How “appropriate pricing” is understood by economists and by users and the implications for practice**

66. 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. This rule is clear and correct, since that is the signal which will cause 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<sup>61</sup>.

67. The first reason for this is that ordinary users understand a price as a payment for a service rendered. When the supplier is a monopoly (and prices are set outside of the market) this means that the “legitimate” price in the eyes of users is that which it costs an efficient producer (usually a public utility) to produce the service. In economic terms, this means that users consider average, not marginal, cost to be legitimate.

68. Two more questions arise from this: what is included in “cost” and what happens if the service provider is not efficient? Costs that users consider legitimate certainly include, in all cases, 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.

69. 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 over-staffed, corrupt and does not 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 in Australia. Before reform, irrigation services were provided by a government department with well-trained and well-performing staff, and there was little corruption. When reform took place, and 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<sup>62</sup>. In most developing countries the inefficiency is much greater and the users’ resistance to paying for these services 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 OED review of the World Bank’s experience with irrigation<sup>63</sup> shows that, despite the fact that the World Bank has been by far the most constant and insistent advocate of cost recovery for decades, “there is no evidence of better cost recovery or of covenant compliance either.”

70. 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 conditionalities, 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 Three: The crucial distinction between financial costs and opportunity costs, and the implications for practice**

71. 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.”

72. Proceeding from the point of view of users (as one must when considering political economy of reform rather than theoretical elegance), it is vital to distinguish between two radically different types of cost. First there are the costs that any user can understand, namely 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 for this “to ensure appropriate resource allocation.” This has not worked in practice for two fundamental reasons<sup>64</sup>. 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 of the resource consider (appropriately) such proposals to be the confiscation of property.



73. An added, and very important, factor is that the ratio between financial and opportunity costs is often radically 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 itself (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, therefore, financial costs generally dominate opportunity costs. Accordingly, as described in the earlier section on water supply and sanitation, the major focus of discussions of “water (supply) as an economic good” focuses on financial costs, and the associated issues of accountability, sustainability and transparent subsidies to ensure that the poor have access to services.

74. 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) is, in situations of scarcity, often much higher (a factor of ten in typical cases of scarcity) than the financial cost of supplying the water<sup>65</sup>.

75. These numbers (remembering, of course, that every place is different) have profound implications. They mean that, from the point of view of 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.)

76. 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.

77. 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 years<sup>66</sup>). In many other cases (such as Western India<sup>67</sup>) these 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, allowed for approved transfers between willing buyers and willing sellers.

78. 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.

79. From the perspective of the present discussion on “how to ensure that users take account of opportunity costs,” these arrangements have a unique virtue. Once users have clear, transferable property rights, then they automatically consider whether they wish to forego 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 new sources of supply.

80. 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 ensuring that the rights of small users are recognized and protected); the plumbing required to measure and move water; the regulatory institutions that are essential 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 in any way minimizing these challenges, three observations are germane. First, the “prerequisites” are really prerequisites 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 are working, often after initial adjustments, reasonably well. In none of the countries that have adopted such systems is there any thought to returning to the previous allocation procedures.

#### **Issue Four: The political economy of change and the consequences for World Bank actions**

81. The implications for World Bank actions are clear. First, from the point of view of financial cost recovery the key is an institutional framework whereby service providers are accountable and efficient. When this happens, and when users see that their payments are being used to improve the quantity and quality of services, they can and will pay. Here (as discussed earlier in the sections on specific water-using sectors) the key watchwords are “competition,” “regulation,” transparency,” “benchmarking” and “accountability”. In the urban water supply and energy sectors these ideas are now common, and World Bank actions mostly consistent with them. In the irrigation sector they are little understood. The World Bank has recently become active in adapting these general institutional principles, has made considerable progress at the users’ level and is now moving to tackle the major challenge of unaccountability and inefficiency 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, service quality declines, etc. In one good example of such innovation, 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<sup>68</sup>. 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.

82. From the point of view of opportunity costs, entitlements and markets, the World Bank has been an active partner 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 will require acute attention to the political economy of reform. Inter alia this will mean, 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 towards improvement, not seeking to attain perfection in one fell swoop; “keeping one’s eyes peeled,” by understanding that it is broader reforms outside of the water sector (often relating to overall economic liberalization, fiscal and political reform) which will provide the pre-conditions for making the critical first steps.

## II: STOCKTAKING AND EVALUATION

### *Building on the 1993 Strategy and consulting with stakeholders*

83. This Strategy, which is a product of the World Bank-wide WRMG, takes as its starting point the well-received 1993 Water Resources Management Policy Paper (WRMPP). This Strategy does not aspire to re-write the WRMPP, but to complement it by focusing on the lessons in translating its principles into practice. The Strategy draws heavily on the OED Report that assesses experience in implementing the 1993 Policy Paper, complementing the OED findings with results of the following reviews and consultations held in the course of 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 [www.worldbank.org/water](http://www.worldbank.org/water));
- ⌘ In-country consultations with the governments of Brazil, China, Ethiopia, Jordan, Laos, Nepal and Thailand (in the process of consulting on the Report of the WCD)<sup>70</sup>;
- ⌘ A global consultation on international waters hosted by Germany in Berlin<sup>71</sup>;
- ⌘ An extensive process of soliciting views on the draft Strategy. This was done by putting the draft Strategy on the external web for comment, and holding eight external consultations with multi-stakeholder groups in Brazil, India, Nigeria, Philippines and Yemen, and special consultations with the private sector, bilaterals and international NGOs (see [www.worldbank.org/water](http://www.worldbank.org/water) for an overall report on these consultations, and details on each one<sup>72</sup>);
- ⌘ Discussions with the relevant sector boards and regions within the World Bank; and
- ⌘ The report of a high-level World Bank-wide panel, which examined the options for a “new business model for World Bank engagement in high-reward/high-risk hydraulic infrastructure.”

84. Finally, this Strategy also draws heavily on two major recent international reports (the World Commission on Water Report<sup>73</sup> delivered at The Hague World Water Forum in March of 2000, and the WCD Report of November 2000) and the recent World Summit on Sustainable Development (WSSD).

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

85. The main thrusts of the World Bank's 1993 WRMP<sup>74</sup> are consistent with the global consensus (embodied in the "Dublin principles" forged in 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 OED review<sup>75</sup> (and the World Bank's experience) indicates that the goals of the 1993 WRMP remain relevant and appropriate, but that progress has been slow in getting actions on the ground.

86. The WRMP provides a vision towards which countries are and should be moving. While experience has reinforced the relevance and importance of the Dublin Principles, a detailed recent review by the Organization for Economic Cooperation and Development (OECD<sup>76</sup>) shows that even the most advanced countries are far from full implementation of these principles in practice, as indicated by the following quotes:

- ≈ "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"; and
- ≈ "The progress achieved to date is the result of many years of effort."

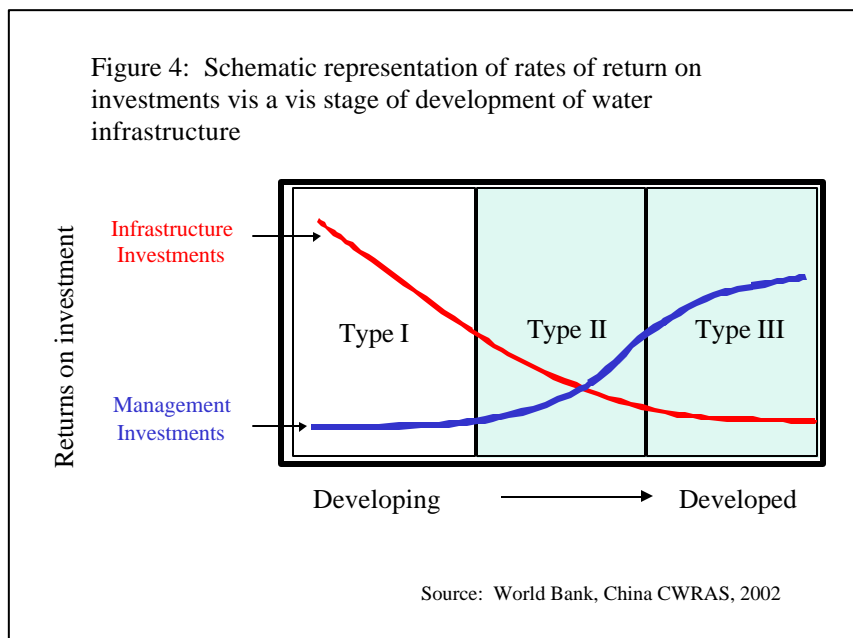
87. The implication is not that the principles are irrelevant, or that progress is not possible. Rather it is that it takes vision, persistence and patience to make progress.

*The wide variety of water resources challenges in the Regions*

88. In **Africa (AFR)**, the high level of rainfall variability is an important factor mitigating against growth and poverty reduction. Whereas temperate countries can typically use about 40 percent of annual runoff through natural regulation (via 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 for any other Region. Much infrastructure built in Africa has been managed and operated poorly. For this reason African countries give high priority to integrated programs aimed at better management of existing water infrastructure, and the development of new, priority, growth-

inducing infrastructure. Given the extraordinary density of international river basins in Africa, cooperation and benefit sharing on such basins—including the Nile, the Senegal, the Niger, the Zambezi, the Congo, the Orange and many others—pose a host of opportunities and challenges in terms of developing benefit-generating infrastructure, and of managing both the infrastructure and the rivers.

89. The countries of **East Asia (EAP)**, 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 4 (developed by the Bank's EAP Region). Much of eastern and northern China face “Type 3” challenges, in which management of already scarce water resources, existing infrastructure and greater attention to pollution are the major challenge. In western China the situation is more of “Type 1/2,” 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, Vietnam and Thailand are facing Type 1/2 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 countries of the Region (Laos, 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.



90. In much of **Europe and Central Asia (ECA)** the challenge is quite different. Most countries in the Region inherited large stocks of water infrastructure; so large that national budgets are inadequate for maintaining this stock. In Russia, 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, however, needed for improved drainage management, and for improved flood management in several countries in the Region. 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 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 context of 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.

91. In **Latin America and the Caribbean (LCR)**, too, there are a wide variety of water resources challenges across the Region and even within some of the larger countries. 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, is 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 major—but uneven—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.

92. The **Middle East and North Africa (MNA)** is the region of the world with the highest level of water stress. Of overriding and universal importance are the issues of 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 (especially agriculture, which uses 85 percent of the water) to high-value (especially urban and industrial) uses are of high priority throughout the Region. Increasing the level of wastewater treatment (from current levels of 27 percent) and re-use of this water is a central, and expensive, challenge. While the major 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 serious 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.

93. The **South Asia Region (SAR)** is, in many ways, a text-book case for the impacts, positive and negative, of water on growth, poverty reduction 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, as a result of both direct effects on farmers and indirect effects operating via the multitude of linkages of agricultural production with the development of local commerce and industry, and even with the economic returns of investments in human capital. Over time, however, a series of serious challenges emerged. Adverse effects of large water projects on some affected people were not adequately taken into account, nor was the evidence of declining performance and rising environmental problems (especially salinization) as a result of disproportionately large attention to construction and disproportionately small attention to management. Compounding these problems has been a Region-wide lack of reform of the fundamental underlying water-use sectors (electricity, irrigation and water supply). A number of governments in the Region have now embarked on major reform programs in the relevant 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 those 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 locally-driven realistic, prioritized and sequenced reform packages, and in supporting appropriate infrastructure investments, which are an essential complement to such reforms.

94. The overall picture, then, is one of enormous diversity and one which defies a standard, prescriptive approach to determining actions and priorities. This means that there is a need for customized, localized analytic work in each Region, country and sub-national entity in order to identify the priority, mix and sequence of management and infrastructural actions that need to be undertaken.

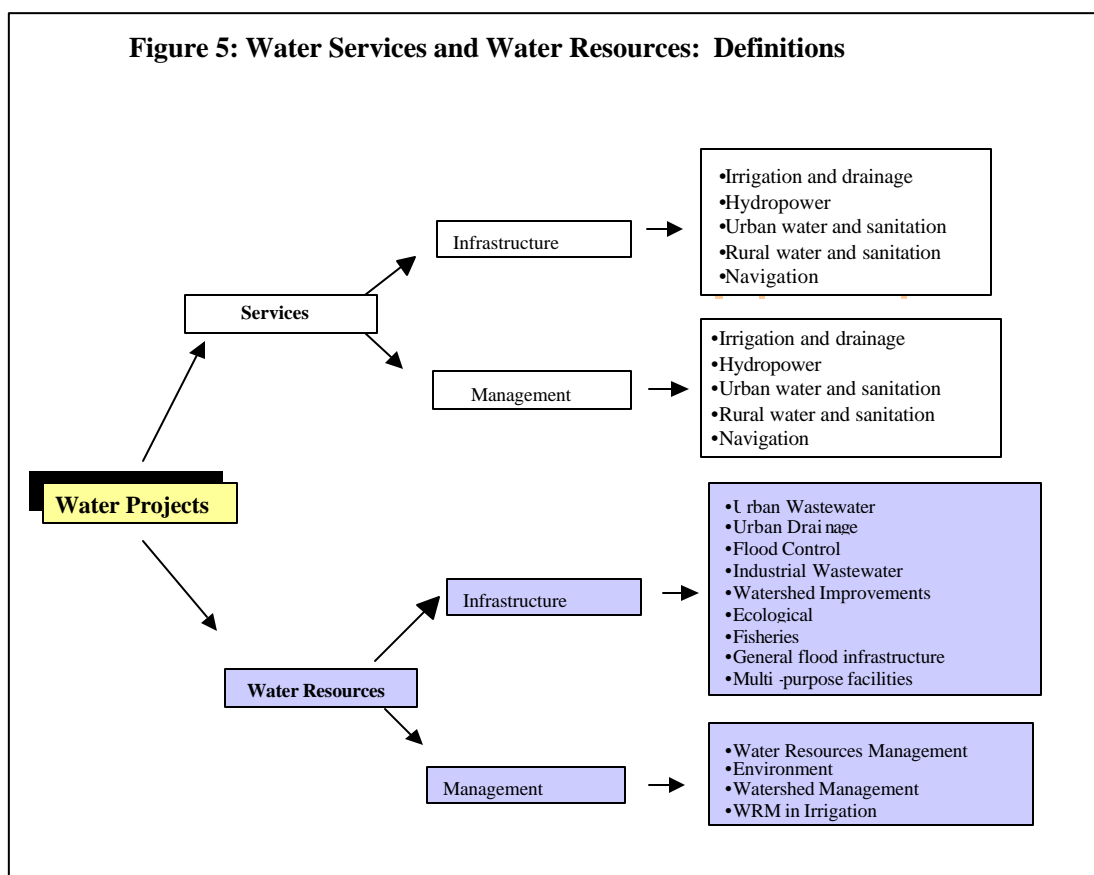
### ***World Bank engagement in water resources development and management***

95. Developing countries invest about \$70 billion annually on 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 Bank-wide and in the regions<sup>77</sup>**

96. All World Bank-financed water projects in the past decade were reviewed and costs allocated to the specific items in Figure 5. The anticipated lending for projects with water resources components, and for those components per se, were estimated for the projects in the lending pipeline for the years 2003-2005.

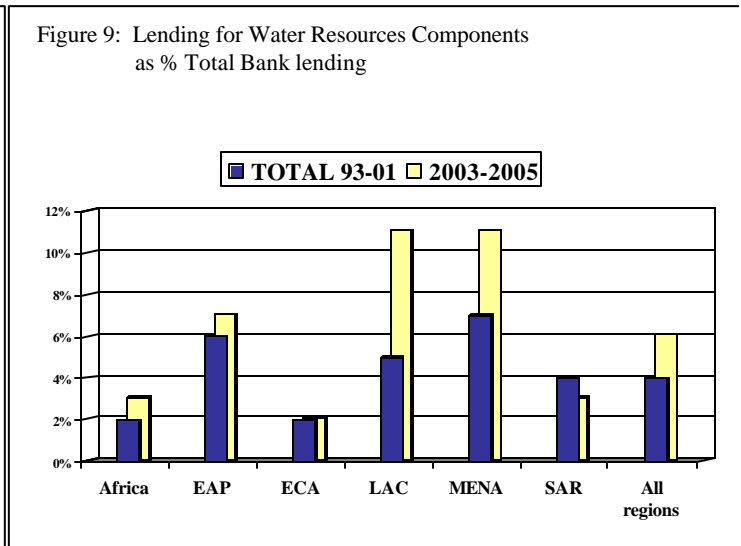
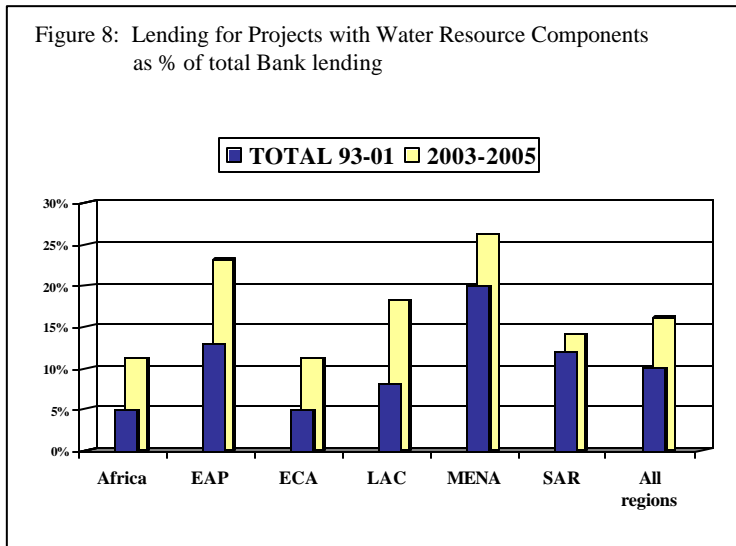
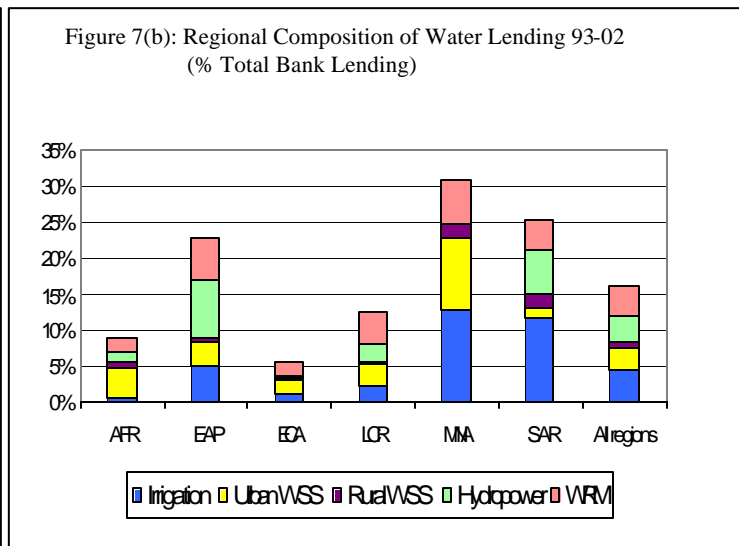
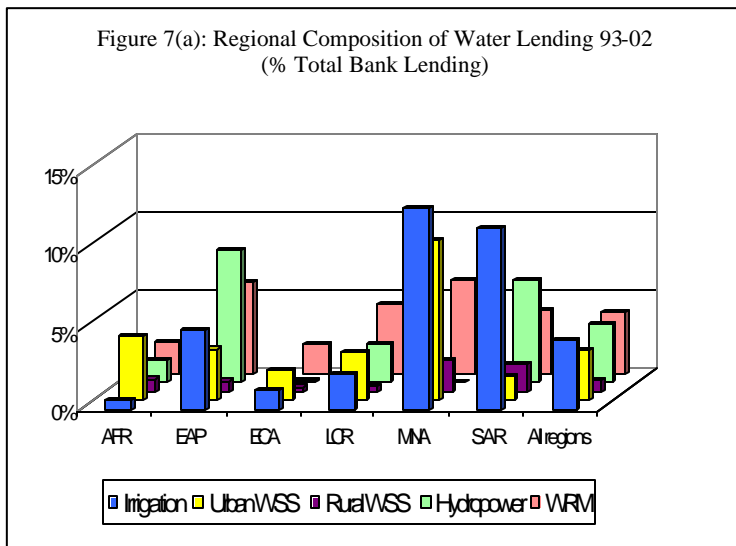
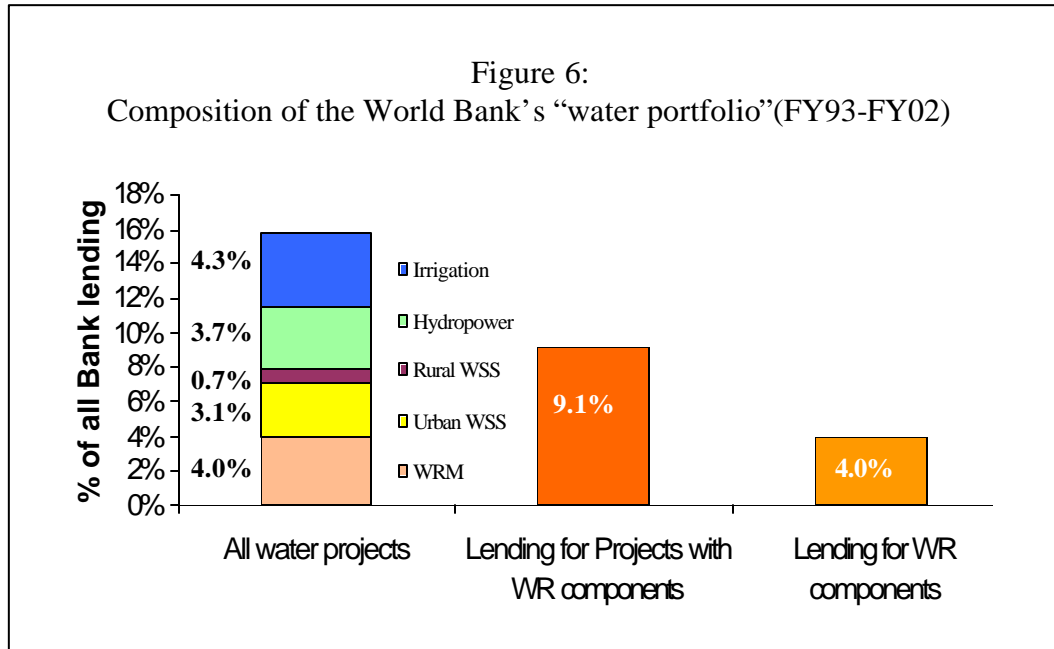




97. In brief, the results are:

- ≈ Lending for water accounted for about 16 percent of World Bank lending over the decade (Figures 6 and 7);
- ≈ 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 6 and 7);
- ≈ Lending for projects that have substantial water resources management components<sup>2</sup> accounted for about 9 percent of all World Bank lending (Figures 6 and 8) ;
- ≈ Lending for water resources components per se accounted for about 4 percent of Bank lending (Figure 6 and 9).
- ≈ As documented by OED, in recent years there has been a shift away from the traditional infrastructure sectors and towards investments in the environment and resource management. About 80 percent of Bank lending for water resources is for water resources infrastructure and about 20 percent in institutional capacity building. The proportion going to institutional capacity building is higher than average in the Latin America and Caribbean, South Asia and Middle East and North Africa Regions.

<sup>2</sup> A project is defined as having “substantial water resources components” when more than 30% of total project cost is allocated to water resource infrastructure and management, as defined in Figure 5.



98. There are wide regional variations in the current and anticipated levels and patterns of lending for water-related projects (Figure 7), for projects with water resources components (Figure 8) and for water resources components per se (Figure 9). In broad outline:

≈ Africa:

- ? Lending for water-related projects accounts (Figure 7) for only 8 percent of all Bank lending in the region over the last decade (compared with 16 percent Bank-wide). Most of this lending is for urban water supply and sanitation projects.
- ? It is projected that lending for projects with substantial water resources components (Figure 8) will rise rapidly (from 5 percent over the last decade, to 11 percent in the period 2003-2005), in considerable part due to the large investments which the Africa Region has made in analytic and advisory work on water.
- ? Lending for water resources components per se (Figure 9) will rise from 2 percent (portfolio) to 3.5 percent in the pipeline.

≈ East Asia and the Pacific::

- ? Lending for water-related projects (Figure 7) accounts for 22 percent of all Bank lending (compared with 16 percent Bank-wide) over the last decade. The Region has had the largest hydropower program, sizeable irrigation and water resources programs, and modest lending for urban water supply.
- ? Lending for projects with substantial water resources components (Figure 8) is expected to rise rapidly (from 13 percent over the last decade, to 23 percent in the period 2003-2005).
- ? Lending for water resources components per se (Figure 9) will rise from 6 percent to 7 percent of regional lending.

≈ Europe and Central Asia:

- ? The Europe and Central Asia Region has the smallest portfolio (relative to overall regional lending) of water-related lending (Figure 7). Lending for water-related projects accounts for only 5 percent of all Bank lending in the region over the last decade (compared with 16 percent Bank-wide).
- ? Lending for projects with substantial water resources components (Figure 8) is expected to rise rapidly (from 4 percent over the last decade, to 11 percent in the period 2003-2005).
- ? Lending for water resources components per se (Figure 9) will stay about constant at a low 2 percent.

≈ Latin America and the Caribbean:

- ? Lending for water-related projects accounts (Figure 7) for about 12 percent of all Bank lending in the region over the last decade (compared with 16 percent Bank-wide). The Region has a balanced portfolio of water resources, hydropower, urban water supply and irrigation lending.
- ? It is projected that lending for projects with substantial water resources components (Figure 8) will rise rapidly (from 8 percent over the last decade, to 18 percent in the period 2003-2005).
- ? Lending for water resources components per se (Figure 9) is projected to rise from 4 percent (portfolio) to over 11 percent in the pipeline, which would make this the region that devotes more of its lending to water resources components than any other.

≈ Middle East and North Africa:

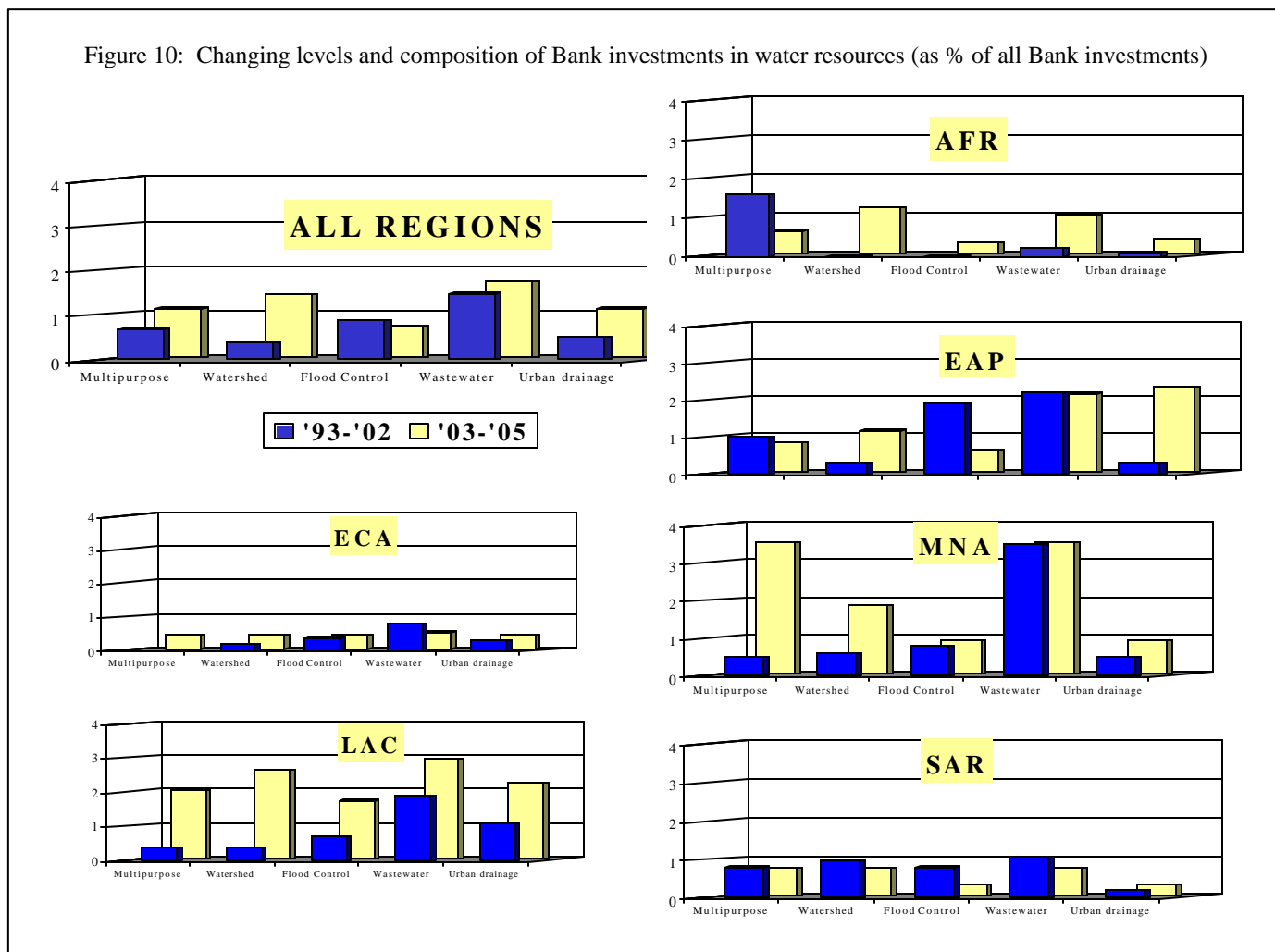
- ? As the driest region of the world, the Middle East and North Africa Region has the largest (as a proportion of regional lending) water portfolio in the Bank (Figure 7). Lending for water-related projects accounts for 31 percent of all Bank lending in the region over the last decade (compared with 16 percent Bank-wide). The Region has substantial portfolios of irrigation, urban water supply and water resources lending.
- ? It is projected that lending for projects with substantial water resources components (Figure 8) will rise still further (from 17 percent over the last decade, to 26 percent in the period 2003-2005).
- ? Lending for water resources components per se (Figure 9) will rise from 6 percent (portfolio) to 11 percent in the pipeline.

≈ South Asia:

- ? Lending for water-related projects (Figure 7) accounts for 25 percent of all Bank lending in the region over the last decade (compared with 16 percent Bank-wide). The South Asia portfolio is dominated by large irrigation and hydropower projects.
- ? It is projected that lending for projects with substantial water resources components (Figure 8) will rise slightly (from 12 percent to 14 percent) over the next three years, while lending for water resources components per se (Figure 9) will actually decline from 4.1 percent to 2.8 percent of regional lending.

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

99. Figure 10 shows the composition of water resources lending in the portfolio and the pipeline, for the World Bank and for each region.

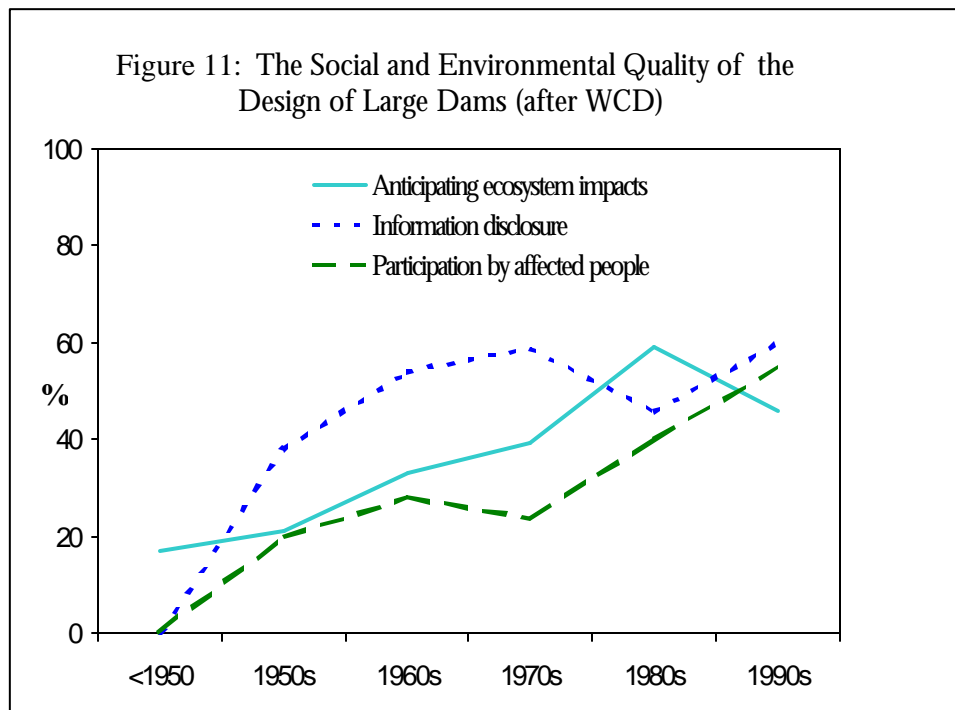


100. Once again, the patterns are quite diverse, mostly for good reasons relating to the quite different challenges in different regions. Some of the noteworthy trends in these data are as follows:

- ⌘ There are large increases Bank-wide in financing for water resources components of projects;
- ⌘ Especially noteworthy are large increases in watershed management and urban drainage;

- ≈ Latin America and the Caribbean, and the Middle East and North Africa Regions, the two regions with by far the highest relative investments in water resources management, invest heavily in wastewater treatment. The huge proportional increases in these regions are driven by large increases in multi-purpose, watershed and urban drainage components of projects;
- ≈ Africa is also expanding rapidly from a low base, and moving towards a diverse portfolio of water resources activities;
- ≈ Water resources activities in Europe and Central Asia remain very low but are gradually expanding. 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; and
- ≈ Although South Asia has a large portfolio of water-related projects (Figure 7), the levels of lending for water resources components in the Region is low and projected to decline.

101. As documented by the Report of the WCD, the World Bank has become a global leader in integrating social and environmental considerations into water development and management, and has played a major role in steady improvements in practice (illustrated in Figure 11) that have taken place in developing countries. This has meant changes in what is done (with large increases in projects dealing with watershed management, for example) and in how things are done. These positive changes notwithstanding, World Bank involvement in potentially controversial hydraulic infrastructure financing (such as dykes, dams, major canals, and inter-basin water transfers) has declined sharply. For example, whereas the World Bank financed 3.5 percent of dams constructed in the 1970s, this had fallen to 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.



102. IFC has six investments (with total commitments of about \$500 million for IFC's own account and the account of participants) in water and sanitation, and ten 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 their business, it is not inconceivable that, as the private sector intensifies its efforts in the development of water infrastructure in emerging markets, IFC and MIGA may in some cases be called to play an enhanced role.

### *The great challenge is making progress, not achieving perfection*

103. While there is a broad consensus on the principles of integrated water resources management, in the words of OED, "translating policies into practice is difficult." OED<sup>8</sup> has assessed how the World Bank's portfolio has evolved since 1993, how consistency with the WRMP has evolved, and how portfolio ratings and quality have changed. The OED found that the volume of World Bank lending for water has increased since 1993; that the composition of the portfolio has changed considerably (with less spending on sectoral infrastructure, and greater attention to water resources management, environmental and institutional aspects); and that consistency with the WRMP has improved (more sustainability, better institutional arrangements and some incipient progress on water as an economic resource). The major OED lessons on implementation 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."

104. 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 WRMPP. 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 which can lead to that end.

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

105. As is evident in many places in this Strategy, the World Commission on Dams Report<sup>79</sup> (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 WCD Report is advocacy of:

- ⌘ Five core values—equity, efficiency, participation, sustainability and accountability—for future decision-making 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; and
- ⌘ A set of criteria for assessing compliance and twenty-six guidelines for review and approval of projects at five stages of decision-making.

106. Most organizations involved in the debate concur with the five “core values” and seven “strategic priorities”. However, in the two years since the issuing of the WCD Report no consensus has emerged on the applicability of the “26 WCD guidelines”.

107. The World Bank conducted a detailed comparison (see Annex 2) of the 26 WCD guidelines vis-à-vis the Bank's safeguard policies<sup>80</sup>. Although there was much in common, there are several important differences. First, while there is agreement on the importance of the rights of affected and indigenous people, in the judgment of the World Bank adoption of the WCD principle of “prior informed consent” amounts to a veto right that would undermine the fundamental right of the State to make decisions which the State regards as being in the best interest of the community as a whole. Second, while there is agreement on stimulating good-faith negotiations on international rivers, World Bank experience (and its policies) are based on proactive engagement rather than disengagement from countries who are not already engaged in good faith negotiation with their neighbors on international waters (as advocated by the WCD). And, third, while there is agreement on the importance of consultation and public acceptance, experience suggests that the multi-stage, negotiated approach to project preparation recommended by the WCD is not practical and would virtually preclude the construction of any dam.

108. 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 WCD “core values” and “strategic priorities” are appropriate principles which are consistent with current Bank practice and policies. The



Bank will not, however, as advocated by the WCD Report, comply with the twenty six guidelines. Rather, the Bank will 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."

109. Finally, it is pertinent to note that a UNEP-led WCD follow-up process<sup>81</sup> (in which the World Bank is participating) is proceeding on a basis quite similar to that articulated by the World Bank: acceptance by all stakeholders of the core values and strategic priorities but recognizing that there is not a consensus among stakeholders on the 26 guidelines.

### *The comparative advantage of the World Bank, and the need for revising business practices*

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

- ⌘ Improved water development and management is **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 terms of performance and knowledge, convening power, ability to link water issues to other sectors through economy-wide engagement, a multidisciplinary perspective, relations with almost all riparian countries, a combination of knowledge and financial 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 the sharing of benefits, not on the sharing of water. Recent work<sup>82</sup> has shown that such work can bring benefits "to the river" (enhanced environmental quality), "from the river" (economic benefits), reducing costs "because of the river" (conflicts among riparians which are exacerbated by conflicts over water) and "beyond the river" (broader economic cooperation among riparians).
- ⌘ 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 where there has been 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 existing 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 which 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 inability 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 engagement with, and 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.

111. 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.

### III: STRATEGIC OPTIONS AND POSSIBLE BUSINESS IMPLICATIONS

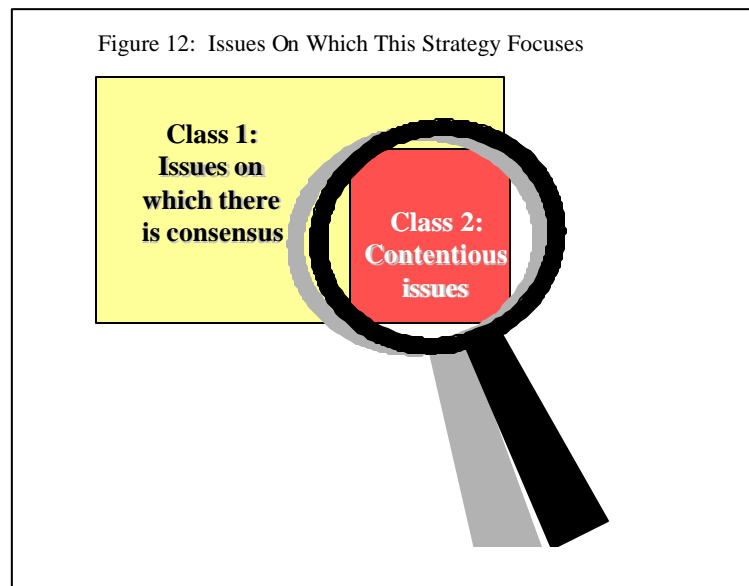
#### *The additionality and focus of this Strategy*

112. There are two distinct classes of challenges that need to be faced if the World Bank is to be an effective partner. The first set of challenges (Class 1) 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”. The second set of challenges (Class 2) 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 well as it could as a reliable and effective partner.

113. The 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 OED Report, the World Bank has invested heavily in these vital areas over the past decade, and will continue to increase such lending. Precisely because there is momentum and no particular barriers in Bank engagement with these issues, there are no major changes of course 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 Paper. Instead the paper focuses primarily on the areas—the difficult and contentious Class 2 challenges—where the attention of, and guidance from, senior management and the Board are required.

114. 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 in Figure 12. Figure 12 shows that the magnifying glass in this paper is applied primarily to the contentious and difficult issues, giving less attention to the more numerous (and very important) issues on which progress is non-contentious and organic. Section IV

shows how the Strategy (and the 1993 Water Resources Management Policy Paper) might play out in different country contexts, and shows that, in most cases, it will be a mix of management and development investments which need to be undertaken.



115. The objective of this Strategy is to position the World Bank to be an effective partner for countries as they seek to develop and manage their water resources in ways that contribute to the stimulation of sustainable economic growth and poverty reduction. The Strategy builds upon 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 the poor).
- ⌘ 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 major 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. 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 use of “next generation technologies,” including demand management, inter-basin transfers and sharing of benefits from transboundary waters. Together, these result in significant increases in (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 potentially 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, inter-basin 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 (in regards to both engagement and non-engagement) and the management of these risks through a diversity of instruments and oversight.

116. 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 which informs management decisions and recognizes differences*

117. 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 OED Report documents an encouraging increase in the quantity of water-related analytic work, and a shift in such work towards the key management challenges.

118. An important area for deepening the World Bank's portfolio of economic and sector work is (as pointed out by the Quality Assurance Group) in more explicitly linking analytic work (which focuses on the challenges to the country) to World Bank activities—both “upwards” to the Country Assistance Strategies (CASs) and PRSPs, and “downwards” 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 CWRAS for one priority country in the region. These will usually not 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 getting agreement with clients. A central element of the CWRASs 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. If successful, it is anticipated that, over time, CWRASs would be done for a number of borrowing countries.

### *Working with partners*

119. As described by OED, “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. As also noted by OED, “a major concern is the inability to meet the cost of proliferating partnerships.”

120. 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.

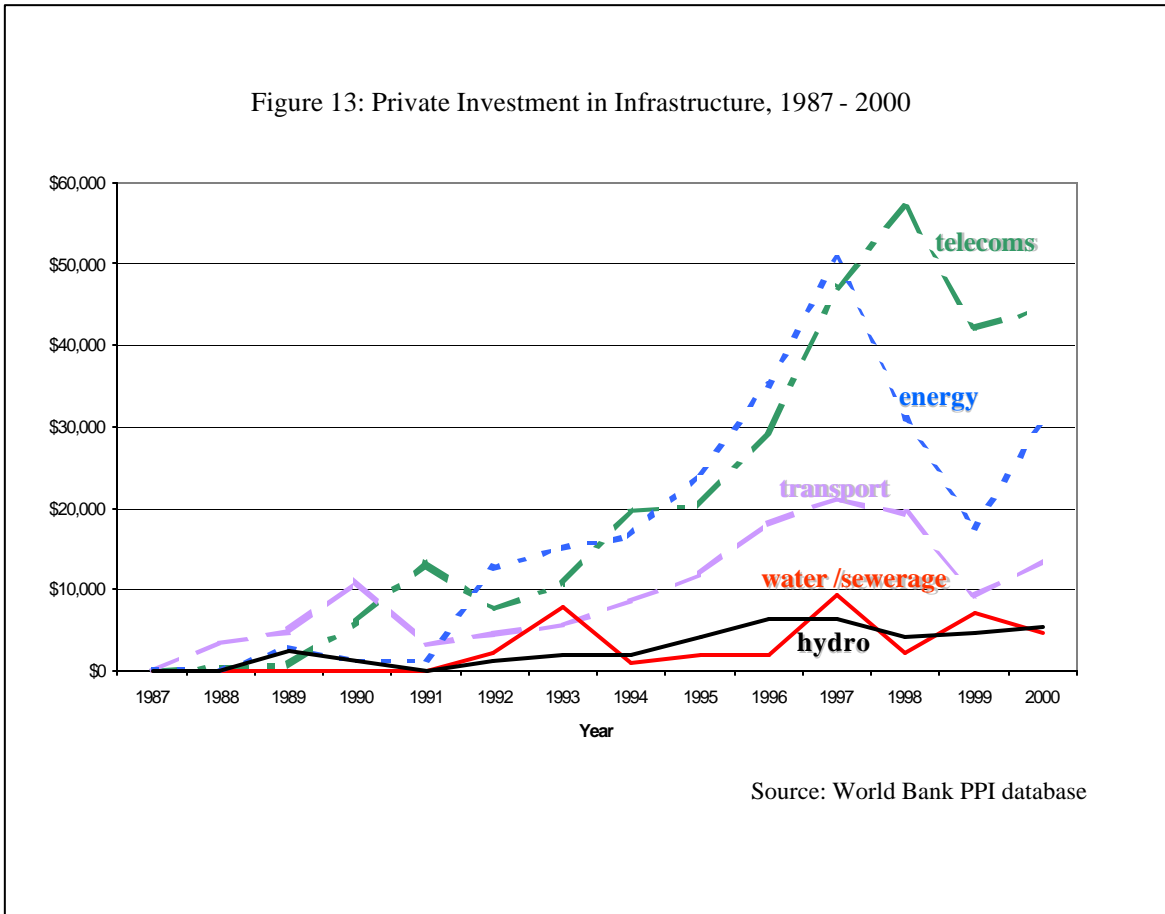
121. Partnerships that make things happen on the ground are already underway, not least at the regional level, where the Africa Region<sup>83</sup> and Middle East and North Africa Region<sup>84</sup>, for example, have developed highly-effective operationally-oriented regional water resources partnerships. The logical corollary is that the World Bank will give priority to action-oriented partnerships—such as the Global Water Partnership<sup>85</sup>, 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.

122. 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<sup>86</sup> provides a useful model. Under this program, the World Bank's WRMG 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). In each case 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 learn and disseminate lessons.

### *Finding new sources of financing for water resources infrastructure*

123. Numerous assessments have documented the huge needs for financing of water-related infrastructure in developing countries. The World Commission on Water<sup>87</sup> estimates that the current level of investment of about \$70 billion a year (including \$17 billion for hydropower, \$28 billion for water and sanitation and \$25 billion for irrigation<sup>88</sup>) needs to increase to \$180 billion a year to ensure water security by 2025. Among the governments of developing countries there is now a broad consensus that while public funds have been and will remain 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 Development Financing<sup>89</sup>, for example, highlights "a need for the relevant international and regional institutions to increase their support for private foreign investment in infrastructure...."

124. 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<sup>90</sup>. Starting from a very low base in 1990, the private sector has invested (see Figure 13) about \$700 billion in infrastructure in developing countries over the past decade.



125. A closer look at the data shows that there are significant challenges to be faced if the private sector is to play a major role in financing of water infrastructure. First, while private investment in infrastructure rose dramatically over the 1990s, by the end of the decade this had declined considerably. The current environment, in which the financial markets have a markedly reduced appetite for risk in emerging markets, suggests that the late 1990s level of financing will not be reached again any time 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.

126. 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. And currently, worldwide, only about 5 percent of water services are provided through the private sector.

127. International private financing is particularly important for small countries that do not have the capacity to raise financing from domestic public or private sources. To stimulate private investment there is a need to develop a more collaborative public-private partnership

approach, 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.** This will involve assistance to the private sector in managing the foreign exchange risk when long-term fixed rate local currency financing is not available, and when short-term financing does not match the economic life of the assets. And it will involve blending public sector funding with that of the private sector to lower the overall cost of capital.
- ⌘ **Legal and regulatory frameworks.** It is only the public sector that can develop a stable enabling environment, in which there are effective and predictable rules and institutions for balancing the interactions between investors, government and users and 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<sup>91</sup>.** Greater use should be made of “output-based aid,” in which funds are disbursed on the basis of actual services delivered. This approach is now being implemented for wastewater treatment in Brazil, for example, by both public and private service providers<sup>92</sup>.

128. 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 for sound water management. While cooperation among 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 the IFC is particularly critical in low-income countries, where domestic and international commercial financing is often not available.

129. 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 OED 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. The case of the concession contracts in Manila provides a graphic illustration. Private operators have become a potent source of pressure to modernize the system of allocation and management of water rights, so that transfers can take place voluntarily and with compensation<sup>93</sup>. Also, recognizing that their investments depended on the quality of their bulk water, they have pushed for and invested in improved watershed management<sup>94</sup>. In a similar vein, the WCD Report shows that most good practices in terms of licensing and benefit sharing are associated with commercially-operated infrastructure.

130. In this regard, the World Bank Group is at a crossroads. While the World Bank Group 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.

131. 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. In this context it is essential to make the very 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*

132. The issue of risk lies at the heart of the development challenge. “Developing countries” is almost synonymous with “high risk”—for people who live there and 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.

133. On the one hand, there are those<sup>95</sup> who believe that the engagement with risk must be defensive, governed by “the precautionary principle” (which asserts that “when an activity raises threats of harm to human health or the environment, precautionary measures should be taken even if some cause and effect relationships are not fully established scientifically.... in this context the proponent of an activity, rather than the public, should bear the burden of proof”.) There is broad agreement that an essential part of good development practice is the assessment of risks, to different groups of people, and both from 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 done if such an approach to risk were taken.

134. 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 in the course of this and other strategies has shown that there are strong concerns from governments, the private sector and many Bank staff that when development risks are high, and Bank engagement 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 non-engagement by the Bank).

135. 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.

136. Before describing some of the elements of the proposed new business model, it is important to emphasize that this focus is motivated by the fact that re-positioning the World Bank vis-à-vis controversial infrastructure is a vital, but complex and contentious task. Detailed treatment of this issue in this Strategy should not be interpreted as implying that such infrastructure is "more important" than other vital (but less contested) management issues, nor should it be interpreted as implying that major infrastructure should comprise more than a modest proportion of overall World Bank lending for water.

137. A first observation is that discussion of risk in the World Bank in the past has been too narrowly and internally focused. The definition of risk must start with the development risks for people in developing countries of either engagement or non-engagement by the World Bank.

138. It is possible to discern different patterns with middle-income and poor 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 the same alternative 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.

139. World Bank projects that include major water infrastructure can be classified depending on 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, *ceteris paribus*, 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; and
- ⌘ That disengagement by the World Bank is the result of a set of disincentives embedded in the World Bank's business practices.

140. An examination of the incentives which operate within the World Bank reveals the following:

- ⌘ There is evidence (as manifested in the recent report of "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 similar controversial projects in other areas).

141. 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: Deciding whether the World Bank should be involved in a specific major water infrastructure project**

**(a) The project must be central to the development objectives of the borrower and the World Bank**

- ≈ **Relevance to overall national development strategies as reflected in the CAS.** This will always include poverty reduction, but it can and should also include broader strategic objectives. In the case of China, for example, 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 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 be engaged not only with “the borrowers who have no other options,” but with its middle-income borrowers.

**(b) The risk profile must be assessed**

- ≈ **The development consequences of the World Bank not engaging.** This 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; and
  - ? The possibility that the project will be done anyway, but will be done 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 non-engagement:

- ? From the perspective of the borrower;
- ? From the perspective of civil society in the borrowing country;
- ? From the perspective of private developers; and
- ? From the perspective of public perception in Part I countries and the related perceptions from NGOs.

≍ **The risk implications must be assessed (by impact and likelihood)**, as must the implications for managing these, monitoring and responding.

≍ **These risk implications must be considered** by regional and World Bank-wide management, which views them in the context of other risky projects, and the regional and World Bank-wide appetite for risk.

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

142. These high-reward/high-risk projects are a special class of operations, because they have spillovers that go well beyond the country and the region:

- ≍ The perceptions (with borrowers, with the private sector and NGOs) are global. For example, the World Bank’s performance on a hydropower project in Laos has a major impact on its ability to attract private partners for similar projects in Uganda. The performance of an inter-basin transfer in East Asia has implications for whether the World Bank will engage with borrowers in the Middle East who have similar needs. And repercussions of the World Bank’s performance on a dam in Argentina, for example, have an impact on the availability of IDA funding for Bangladesh.
- ≍ They involve dealing with common sets of environmental and social issues.
- ≍ They involve dealing with common sets of stakeholders, including civil society and NGOs.

143. 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 remain accountable for these projects. However, from an early stage these projects will be brought to the attention of Senior Management, who will, in support of the Regions, participate in decisions on whether or not the World Bank will get engaged and how risks will be managed.

- ⌘ **Improved implementation of safeguards.** Good preparation, including adequate attention to safeguards, involves short-term costs, but decreases costs in the long run. For these projects there will be an agreed-upon corporate strategy for ensuring that the objectives of the safeguard and other operational policies are respected, while focusing attention and resources on those safeguards that are material in particular circumstances.
- ⌘ **Communication.** An essential element will be the development of a unified communication strategy for addressing the concerns of different stakeholders, including critics, head-on in an open manner.
- ⌘ **Resources.** While there will not be an automatic ex ante 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 as and when 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 “on their own,” but will have consistent support from regional and corporate management, and will get recognition for this difficult work.

### *How the World Bank is organized and staffed*

144. Water Resources Management (WRM) is not a “sector” but a set of cross-cutting legal, regulatory and operational activities. For this reason WRM 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 fine-tuning of existing institutional arrangements to ensure that there is accountability and resources for ensuring that the necessary connections are made.

#### **In the Regions**

145. 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 advisors in all regions.

146. The formal nomination of these regional advisers, and their appointment to represent the Region on the WRMG, 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. As is inevitable and even appropriate 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 Advisor a mandate to stimulate and direct the region’s work on water resources, and have assigned substantial regional resources to undertake this

work. The Regional Advisor and his team (most of whom continue to work in their host departments) have a strong presence both in the Region (in Washington) 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 MNA the Sector Manager for Water and Environment in the Rural Department has functioned as the region's Water Advisor. This arrangement has worked well, providing high-level visibility for the Bank's water resources work in the Region. In the view of the MNA Regional Management Team, the next steps involve working to integrate the Bank's water assistance to countries. An important mechanism for achieving this integration is the Country Water Resources Assistance Strategies. These 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 LAC, too, the Regional Water Advisor is a Sector Manager, this time responsible for the urban and water portfolio in the Private Sector and Infrastructure (PSI) department. The regional appointment has been mirrored in joint appointments of PSI and Environmentally and Socially Sustainable Development (ESSD) 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 the rapid growth in the regional portfolio of water resources investments.
- ≈ In SAR the Regional Advisor was recruited with a mandate to provide leadership on water resources in the region. He 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 SAR Regional 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 Advisor that are for strategic work not directly related to country or regional operational tasks.
- ≈ The EAP Region has been operating under a more informal approach to water resources management than other regions. Two years ago the EAP region appointed a Regional Water Advisor for the first time. Although the informal approach has been effective, EAP regional management has recognized the need and is in the process of designing a more defined approach including the establishment of a virtual water team coordinated by the Regional Water Advisor that will have responsibility for: (a) preparing and implementing cross-sectoral activities such as regional and country water resources strategies; (b) providing quality enhancement in the form of reviews of project concept, appraisal and other related documents and analytic work, and (c) in general improving coordination of water-related activities throughout the region.
- ≈ In ECA responsibility for coordinating the Bank's work on water resources is shared by a manager with responsibility for natural resources, and a water professional who has extensive operational responsibilities. Information sharing and coordination of the modest but gradually expanding water portfolio is done informally but effectively.

147. As a result of the discussions that were part of this Strategy, in some regions modest additional resources are being made available to the Regional Water Advisors 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**

148. Seven years ago, in response to the World Bank's 1993 WRMP, a Global Water Unit was set up. The basic task of the Unit was to help the Bank become a better partner in implementing the principles of integrated water resources management articulated in the WRMP. A core task was to improve coordination among the disparate parts of the World Bank Group (the regions, IFC, the parts of PSI and ESSD) that worked on water resources, to ensure greater coherence of work on water resources. The manager of the Unit (the Senior Water Advisor), reported to the Vice President of ESSD.

149. In 2000 the President of the Bank announced a "ramping up" of the 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 the various units working on water was vital. The Vice Presidents of ESSD and PSI announced the creation of the WRMG with some of the functions of a Sector Board, namely enhancing quality of lending and analytic work, human resources, corporate positions and outreach, and knowledge management.

150. Members of the WRMG are the regional water advisors, as well as the leaders of the anchor units on water supply and sanitation, irrigation, hydropower and environment and key staff who work on water-related issues in the IFC, MIGA, the Legal Department and the World Bank Institute (WBI). The WRMG is chaired by the Senior Water Advisor. By agreement between the Vice Presidents of PSI and ESSD, the WRMG and the anchor unit (the former Global Water Unit) is housed in and financed by ESSD.

151. In some respects the WRMG has worked reasonably well. It has managed major policy tasks (including the response to the WCD 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 with major events (such as the World Water Fora and the WSSD); it has developed a Human Resources Plan for Water Resources in the World Bank, and it has developed effective collaborative arrangements: 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 (into which most staff working on water resources are "mapped").

152. 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 WRMG. First, the Chair of the WRMG (the Senior Water Advisor) will formally report to both the Vice Presidents of PSI and ESSD. Second, both ESSD and PSI will contribute to the budget for the WRMG and the anchor unit.



## Human Resources

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

154. There are about 230 staff in the World Bank—about half from Environmentally and Socially Sustainable Development (ESSD) and half from PSI—that deal with water resources on a full- or part-time basis. About 80 percent would consider having “water resources” as a family affiliation were such an option available. Renewal of experienced staff is a major challenge, with half of staff (the most experienced half) due for retirement in the next ten years. A recent survey of water resources staff, undertaken by the WRMG, has shown that about 15 percent of the 169 respondents spend up to 100 percent of their time on water resources management (WRM) activities, but over half spend up to 25 percent. This implies that WRM training and knowledge management need to be made available to a wide variety of staff, not only those who work full time on WRM issues.

155. According to the survey, as well as experience from attendance at the annual World Bank Water Week and at water resources seminars, the overwhelming majority of staff are interested in both WRM training and knowledge management. Needs are greatest for legal, institutional (e.g., river basin management, international waters) and financial and economic expertise, in addition to drought, flood, coastal zone and groundwater management and water/environment issues.

156. The objective of the WRM Human Resources Strategy, as approved by the WRMG, 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 regarding WRM. The 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 WRM that would provide them with a multi-disciplinary vision with the basis to become “integrators” (i.e., professionals working on cross-cutting issues between water sectors) and able to deal with the highly varying content of current and future water resources projects. Sector staff (e.g., water supply, energy, agriculture) continue to be specialized 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 WRM 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 WRMG and WBI<sup>96</sup>, 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; as well as a base course for staff who work mainly in water-related sectors, to provide them 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, which is the knowledge management arm of the WRMG. Again the severe resource limitations of the WRMG have meant that progress has been slow.

157. Bank re-engagement with high-reward/high-risk hydraulic infrastructure implies a re-aligned profile of professional staff. Specifically, it means that, after a decade in which the focus has been on recruitment of social and environmental staff, there needs to be an emphasis, again, 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.

158. 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. This is so because it is the Sector Boards (especially the Water and Sanitation, Rural and Environment Sector Boards) which have responsibility for recruitment and human resource actions for staff who work on water resources. The WRMG recognizes that primary responsibility is with the Sector Boards, and so the WRMG 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.

## IV: WHAT THE STRATEGY MIGHT MEAN FOR WORLD BANK ENGAGEMENT: SOME ILLUSTRATIVE EXAMPLES FROM DIFFERENT REGIONS

159. In any particular country setting, the World Bank's activities in water resources management are the result of three principal drivers: (a) the nature of the challenges in the country, and the approach of the society to these; (b) the CAS, in which the government and the World Bank agree on priorities and approaches; and (c) the strategic thrusts of the 1993 WRMP 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:

- ⌘ **In terms of management:** How can the general principles of the 1993 WRMP be applied to widely-varying local contexts, with an emphasis on sequencing, patience and attention to the political economy of reform?
- ⌘ **In terms of infrastructure:** What is the likely engagement of the World Bank in hydraulic infrastructure of varying scales, including large "high-reward/high-risk" infrastructure?

160. The examples show that the challenges facing different countries and regions vary widely, and that the 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<sup>3</sup>:

161. Brazil is the eighth largest economy in the world, and a country with strong domestic capacity in water service and water resources management. During the last decade, the country has adopted unprecedented reforms of the legal and institutional framework for water resources management



<sup>3</sup> This assessment is based in part on the consultations which were held with a variety of stakeholders in Brasilia in February 2000. All of the presentations, panel discussions and reports from that meeting are available on [www.worldbank.org/water](http://www.worldbank.org/water). This was 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.

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 strategy that builds on its comparative advantage and value added.

162. 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 rapidly-urbanizing economy. As this first wave of “primary demands” was met, Brazil’s (and the World Bank’s) focus shifted to the second-generation challenges. Prominent among these are:

- ⌘ **In the urban sector.** Development of financially-viable urban water and sanitation utilities and, recently, the stimulation of private sector participation and formal approaches to regulation; development of technologies and social approaches for increasing network coverage (especially of the poor) 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 metropolitan areas.
- ⌘ **In the energy sector.** Liberalization of the energy sector and development of the appropriate regulatory structure (which includes many water rights issues since hydropower accounts for 90 percent of electricity supply in Brazil).
- ⌘ **In the rural sector.** 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.** Stimulation of innovative approaches to participatory resource management at the state and federal level, including the development of the appropriate financial, legal, regulatory and institutional approaches; supporting infrastructure and management arrangements for sustainable water services in the dry and poor areas of Northeast Brazil.

163. Over the past decade the World Bank has engaged directly with the political economy of water reform. A first key element has included 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. This meant that the World Bank’s resident Country Director was immersed in the political reality of the country, and that the field-based staff were easily accessible to all stakeholders and perceived as being full-time partners.

164. 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 towards 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) who commit to making fundamental reforms. These changes in business practices have not only been important in and of themselves, but they have had a demonstration effect. 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 implementation of the World Bank’s new Private Sector Development Strategy), and uses the resources it has for pollution control 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.

165. The country stakeholders’ generally positive perception of World Bank engagement has been affected, 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 and checking rules, 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).”

166. Leading political and professional figures in Brazil stress that the value of the World Bank is not in dealing with the routine and the mundane. What they want is World Bank engagement (sometimes by providing advice; sometimes through lending, too) in the difficult issues which are now the cutting edge in Brazil. These include major hydraulic infrastructure projects, such as the proposed inter-basin 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 macro-economic, financial, environmental and social aspects with the technical issues; and for its ability to mobilize knowledge gained from global experience.

167. The World Bank and the government are currently in the process of refining their cooperation strategy (developing a CWRAS) 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, and include:

- ⌘ 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 the management of these at both 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 efficiency of utilities, expand coverage to the poor 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 multi-state Paraíba do Sul River in the Southeast (where pollution control and protection of drinking water quality are the main challenges) and on the multi-state São Francisco River in the Northeast (where the challenges are primarily quantity management, management of the cascade of dams down the river, and the issue of inter-basin transfers out of the river). Major issues will include those of the role of the federal and state governments, participation in the basin agencies, and allocation and management of consumptive and non-consumptive 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 terms of water rights and their 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, inter alia by identifying business risks and devising strategies for mitigating these; and
  - ? Support for ANA in the development of its strategic planning and business management approaches.

168. As with the other focus country studies, the experience of the World Bank in Brazil had a substantial impact on the main messages of the Sector Strategy. This successful experience highlights 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; and
- ⌘ Starting with the “low-hanging fruit” and then, with credibility and experience, moving on to bigger challenges.

169. 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<sup>4</sup>

170. The countries of Central Asia are water scarce. Two rivers, the Amu Darya and Syr Darya, 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 a reduction of about 80 percent 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 over 50 percent over the last 40 years, has meant economic losses for the 3.5 million people living in the vicinity of the sea—from declining fisheries, loss of wetlands, and health impacts from blowing salt and highly saline shallow groundwater.

171. 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, comprising 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

<sup>4</sup> For all other regions, these assessments of what the SSP might mean are based in part on the consultations which were held with all stakeholders in preparation for this Strategy. Due to budget constraints no consultation was held in ECA.

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 the adverse environmental impacts.

172. As in other parts of the Europe and Central Asia Region as well as 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. The state of this infrastructure has deteriorated over the last ten years as institutions have weakened, systems for funding operation and maintenance have collapsed and adequate alternatives have not yet been put in place.

173. A particularly important aspect of irrigation management in arid lands is that of the removal of drainage water. The excessive application of water to irrigated lands has led to waterlogging and mobilization of vast quantities of salt. An estimated 6 percent of the irrigated area now has highly saline soils, while water tables are now within two meters of the surface for about 35 percent of the area. Salinity levels and unreliable water delivery are especially severe problems in the “tail-end” of the irrigation system, namely 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.

174. 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 system, on an “irrigation” mode, with water stored in the winter and released during the warm growing season to provide water to the downstream countries. The lower riparians, rich in thermal energy sources, provided coal, oil and gas to the upstream countries for winter heat.

175. Since 1990, with the breakup of the Soviet republics into independent countries, and moves towards market pricing for thermal energy, the management system changed. The upstream countries, with very low per capita incomes and few natural resources apart from hydropower, have increasingly released water from reservoirs in the winter to generate cheap electricity for heating, and to save the foreign exchange costs of imported fossil fuels. But there is an incompatibility between winter releases of water for electricity, and 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 there are differing views between the countries on what is a “fair” price for electricity.

176. Alternative 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.



177. As in many other developing countries, water and sanitation utilities in Central Asia are having to make a transition towards 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.

178. 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 with 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. As a result of a National Environmental Action Plan and World Bank-supported sector work, it was determined that clean-up of the mercury was a far more cost-effective solution (with a cost of bulk water of about 8 US cents per cubic meter, instead of the 80 cents required for the inter-basin transfer).

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

180. 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 mothball or even abandon major pieces of infrastructure.

181. With regard to dams, the primary challenge is, again, to maintain the existing stock in a serviceable and safe manner. The World Bank has been and will be involved in working with the 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 dissemination of 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 Asia will be affected by climate change, with temperatures, precipitation and net evapotranspiration rising, and extreme weather events becoming more frequent.

182. In summary, the challenges of water resources management and development in Central Asia are daunting. As this brief overview suggests, the solution does not lie within the water sector alone. Rather, progress (which has been and will continue to be slow and difficult) requires concerted and integrated action through a wide variety of sectors (including the usual water-related sectors, but also macro-economic, 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 the Central Asia sub-region accordingly includes the following elements:

- ⌘ Work on a Regional Water Strategy which will build on the World Bank-wide Water Resources Sector Strategy and regional experience;
- ⌘ Sub-regional 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 on irrigation and drainage rehabilitation, within the Central Asian countries' macro-economic and borrowing constraints;
- ⌘ Support to wetland, grassland and fisheries restoration in the 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 management of 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 wastes;
- ⌘ Assistance with restructuring water utilities in major urban areas, in order to improve service levels and move towards financial viability; and
- ⌘ The use of both advisory and investment tools for facilitating benefit sharing on international rivers.

183. Finally, it is apparent that the World Bank's ongoing and planned work in Central Asia both supports and feeds into the main themes of the Water Resources Sector Strategy. In Central Asia (as elsewhere) the challenge is the use of both management *and* infrastructure instruments, with the latter largely (but not exclusively) confined to the development and implementation of a strategy for maintaining an appropriate stock of infrastructure. It is also apparent that the task, in the economy and in water management, is not solely in identifying where to go, but in 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 general and the state of Andhra Pradesh in particular<sup>5</sup>:**

184. Water resources management and development has played a major role in development, food security and poverty reduction in India. The consequences of these investments include: an enormous increase in the production of food and food grains, with major positive impacts for the many poor who are net food purchasers; large declines in poverty (with poverty rates in unirrigated districts almost three times the level in irrigated districts); and with large multipliers (of the order of two) in terms of secondary and tertiary economic impacts.

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

186. Over the past decade and more, however, the nature of the water development and management challenges in India has changed. While there remain important opportunities for



<sup>5</sup> This assessment is based in part on the consultations which were held with a variety of stakeholders in New Delhi in May 2000. All of the presentations, panel discussions and reports from that meeting are available on [www.worldbank.org/water](http://www.worldbank.org/water).

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 is stagnation or standoff. “Stagnation” in the sense that failed institutional models have not been reformed; and “standoff” and polarization 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 new role that would be more suited to the challenges facing the country, and more broadly accepted by all parties. Efforts to promote reform, however, often had little result.

187. In recent years the World Bank has taken a radically different position to overall engagement in India. The pillars of this reform strategy (as manifested in recent CASs) are:

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

188. What has this change meant, and what might it (in conjunction with this Water Resources Sector Strategy) mean for future World Bank work in water management in India?

189. 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, which played such an important role in food security, rural development and poverty reduction, have largely become inflexible and ineffective at providing the services that users demand. The World Bank has recognized for some time the importance of reforming the way in which public irrigation services are provided, but has struggled with finding a means for translating ideas into actions.

190. A critical turning point came in the late 1990s, with the advent of the World Bank’s overall “focus on reforming states” strategy. The first and strongest reformer was the Government of Andhra Pradesh. Drawing on international best practice, the World Bank provided strong support for the introduction of Water Users’ Associations as a key first step in this reform process. With strong political and bureaucratic leadership from the State, Water Users’ Associations were formed in all of the state’s public irrigation systems. This ambitious experiment has proved to be successful. Last year, for example, during a severe drought, water distribution and overall productivity improved. The success to date is attributable to two factors—the intelligence and ingenuity of the farmers, and the extraordinary political and bureaucratic leadership. (To cite just one illustrative example, every few weeks the Chief Minister has a videoconference which involves senior administrators in each of the 20-odd districts. Inter alia, central and district administrators are called on to account for their performance in managing irrigation systems. Equally remarkable, the press, both in the capital and the districts, is invited.)

191. The Andhra Water Users' Association revolution has set a standard for other states to follow. The lessons are illustrated by the quotes from a group of Haryana farmers, who went on a "study tour" of Andhra Pradesh: "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."

192. Global experience shows that WUAs are a necessary, but not sufficient condition for improved 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 are centering 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.

193. 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 decision-making lag far behind. The challenge includes developing a legal, regulatory and institutional basis for making reallocation of water more flexible and voluntary, and accordingly calls for careful attention to the highly sensitive but central issue of the water rights of users. It also means developing an approach to incorporating 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, which is 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.

194. While supporting "the focus states with integrated packages of fiscal, civil service and sector reforms" remains the foundation of the World Bank's India CAS, the Strategy also has room to support stand-alone innovations in "non-focus states" that 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 remarkable project for the reclamation of sodic lands in the Gangetic plains. In both cases the beneficiaries are poor farmers and the environment. The recently approved Water Sector Restructuring Projects in the States of Uttar Pradesh and Rajasthan are the first of a new generation of projects that reflect the required paradigm shift in World Bank-financed water resources projects.

195. In terms of 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. The World Bank has, accordingly and appropriately, decided to discontinue financing of urban utilities unless they are associated with major institutional reforms. The World Bank is now

focusing its advocacy and advisory services on states that have shown commitment to fiscal and institutional reforms.

196. The World Bank's strategy regarding hydropower is much the same. India has very substantial undeveloped hydropower potential. But the electricity sector remains one with 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 and when there are fundamental energy sector reforms. If and when 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.

197. 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 new resources, as illustrated in the case of Andhra Pradesh. The waters of the one major river in the State (the Krishna) are fully developed, but there is lots of water 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-independent days of the Nizam, and with water scarcity contributing to security issues). A simple economic analysis tells the State (and the World Bank) that developing these water resources for this purpose is not the best use of limited financial resources. But the political and security imperatives are great. While the State has decided that it will not 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 but will maximize the likelihood of sustainability and limit the damage to the state fiscus.

198. The World Bank is actively engaged in Andhra Pradesh in the provision of knowledge and advisory services: in overall terms on the water components of the State's "2020 Vision" document; in terms of benchmarking and irrigation reform options; on utility reform; groundwater management; 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; and
- ⌘ 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.

199. The experience of the World Bank 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 play an important role in improving 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 in investing in ways that make the reforms durable. Fifth and finally, reforms are neither simple nor 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<sup>6</sup>:**

200. 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. With the return of democracy, however, the World Bank has re-engaged in the country. This re-engagement opens a special and daunting set of challenges for the World Bank, in which the two-way link between water and



politics (present everywhere) is particularly evident. In the water sector the most immediate and visible (and therefore important) problem is that of urban water and drainage services, with Lagos particularly prominent.

201. The recent performance of 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 multi-track engagement strategy which, in many respects, can be considered a “best practice” application of the main strands of this Strategy. The first track involves assisting Nigeria to move rapidly to address the most politically visible issues in innovative ways. The performance of public utilities has in many ways come to symbolize the poorest aspects of governance in

<sup>6</sup> This assessment is based in part on the consultations which were held with a variety of stakeholders in Abuja in September 2000. All of the presentations, panel discussions and reports from that meeting are available on [www.worldbank.org/water](http://www.worldbank.org/water).



Nigeria. Lagos is the 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 towards the creation of revenue.

202. The World Bank (including IFC and the WBI) has been heavily and productively 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 in the form of a concession contract, which will be awarded on the basis of a competitive bidding process. The remainder of the city will be served by a less ambitious management contract, which is currently under preparation. Closely associated is the issue of urban drainage and sanitation in Lagos, an issue which the World Bank is addressing through both lending and advisory services.

203. The situation in many other Nigerian cities is not much different. Even Kaduna, which has been the greatest beneficiary of World Bank loans (for twenty years), and has one of the better utilities, still does not cover all of its operation and maintenance costs. The World Bank will now 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 an innovative, demand-driven approach. The Small Towns Project includes the contribution of communities to the construction cost of the facilities while contracting out the operation and maintenance to the private sector.

204. The second track of the World Bank's strategy for water management in Nigeria involves addressing a series of important, albeit less politically 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, fadama groundwater irrigation project. The World Bank might also address the large public-sector irrigation projects run by the so-called "River Basin Development Authorities," where less than 10 percent of the command area of 400,000 hectares actually gets regular supplies of irrigation 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 to the utility level (applying the ideas of benchmarking, competition, private sector participation, and accountability to reform of the service agencies).

205. 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 conjuncture of irrigation, urban water supply, and ecological flows for floodplain agriculture in the Hadeija Jamaare Basin. A second important area is that of micro watershed management, on which the World Bank has recently initiated an innovative first project with a strong poverty focus. And finally there is a set of important international water issues relating



to the 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 GEF funding). The focus in these endeavors has appropriately been on raising awareness and building capacity.

206. 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 the Sector Strategy.

207. The political reality of Nigeria poses a major challenge in designing and implementing World Bank activities, especially those involving infrastructure investment. In these areas 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.

208. In the past few years the World Bank has dealt with these challenges in an imaginative and in many ways courageous manner. 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 multi-track approach;
- ⌘ Has proceeded, where possible, by building on the formidable grassroots capacities available (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; and
- ⌘ Has proceeded on parallel tracks in building the knowledge and institutional base for dealing with the longer-run resource management challenges both within Nigeria and in the international basins of which Nigeria is a part.

**Illustration #5: What the new Sector Strategy might mean in the Philippines<sup>7</sup>:**

209. The recent experience of water management in the Philippines is a graphic illustration of one of the central themes emerging from the OED review of the experience in implementing the World Bank's 1993 WRMPP. In particular, it is a striking example of how, in the words of OED, "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..."



210. 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 in the country. Despite initial leadership by President 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.

211. The second part of this 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 he had with introducing private sector electricity suppliers; he wished to bring the same dynamism to the water service business. The World Bank was an enthusiastic partner, since the publicly-operated utility had become a textbook case for the failure of donor-supported incremental reform. (After thirty 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 government in the concession process, which has become a model (documented in an excellent book by the civil servant who led the process) of transparent governance. While the focus was, correctly, on getting better services to the people of Manila, the concessions helped give rise to a series of unforeseen but equally important ripple effects, within both the service and resource management sectors.

212. In the urban water sector, the World Bank, in partnership with public sector banks, is trying to build on "the momentum of Manila" and to respond creatively to the new reality of

<sup>7</sup> This assessment is based in part on the consultations which were held with a variety of stakeholders in Manila in February 2000. All of the presentations, panel discussions and reports from that meeting are available on [www.worldbank.org/water](http://www.worldbank.org/water).

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 the important and difficult sewerage issues. An implicit element of this strategy is developing competition to the Local Water Utilities' Administration, the national urban water supply agency that is now under heavy pressure to reform.

213. In terms of resource management, the "ripple effects" from Manila are transforming the way in which water resources are managed in the Philippines. These transformations have originally centered on the Angat Dam, which serves as the main source of bulk water for Manila, but which also provides water for about 30,000 hectares of irrigation facilities. First, although the distribution of the water has been privatized, MWSS, the old public agency, still has the bulk water right 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 the water rights issues and is helping define transparent mechanisms for water reallocation under a transferable water rights framework with equitable compensation for the involved stakeholders.

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

215. Given the illustrious history of Water Users' Associations in the Philippines (dating back to the 1970s, and serving as an inspiration to much of the participatory irrigation movement around the world), it is surprising that there has been 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 which has not been effective and accountable to users, in part because it depends on donor funding for about 80 percent of its capital budget and a large part of its operating revenue.

216. The World Bank is now in the process of re-thinking its approach to irrigation reform in the Philippines. The starting point for such thinking 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 leadership willing to address the thorny issues of agency reform.

217. In terms of water resources management, it is clear that effective action requires both working "from the top" (in terms of enabling legislation and support for local efforts) and "from the bottom," where there is a real demand for solutions. Currently in the Philippines 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 the case of Manila privatization has helped catalyze reforms; in Cebu it is local civil society which 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 where there is not 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.

218. At the request of the Philippine government, the World Bank is providing technical assistance to the National Economic Development Authority for the upcoming Third National Water Summit. Support is being provided to address issues including water resources management, institutional reform, raw water pricing, demand management, river basin management, irrigation reform, and tradable water rights. While the focus is on overall policy reform, recommendations are being formulated to address actual cases such as Angat that can provide a tangible example to help foster reform nationwide while addressing critical problems.

219. As with the other focus country studies, the experience of the Philippines had a substantial impact on the main messages of the Sector Strategy. The Philippines experience indicates, in the words of one of the participants 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.

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

- ⌘ Acting where there are powerful 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, and hopefully “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; and
- ⌘ Fostering the synergies that can be created when members of different parts of the World Bank Group (in this case the IFC and the World Bank) 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<sup>8</sup>**

221. Yemen faces one of the most dramatic water management challenges in the world. Most of the population lives in highland areas and depends almost entirely on groundwater for domestic, agricultural and industrial supplies. Over the last twenty years a groundwater revolution has taken place, with the widespread adoption of tubewell



technology. This revolution has brought prosperity to rural areas but 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 resources. But in the long term the situation is even more daunting, for there is simply no way people can live where they do unless water is managed more sustainably.

222. Compelling as the demographic/hydrological imbalance is, the odds are heavily stacked against effective action. This is so for several reasons. First, groundwater management is a classic “open access resource management problem,” which poses major difficulties even in the best of 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 “prerequisites” are in place. The notion of “national management and national legislation” is an unrealistic one in a country where there are severe capacity constraints in all sectors. This means that groundwater management necessarily has to be done aquifer by aquifer, at the local level. And here, too, the situation is difficult. 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 where some information is available, the situation presents a set of formidable challenges, including inequitable use of existing

<sup>8</sup> This assessment is based in part on the consultations which were held with a variety of stakeholders in Sana'a in September 2000. All of the presentations, panel discussions and reports from that meeting are available on [www.worldbank.org/water](http://www.worldbank.org/water).

resources (with a handful of large landowners typically responsible for most of the abstractions), an absence of formal property rights, and a lack of local institutional structures for managing the new type of conflicts that the tubewell has created.

223. 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 WRMPP, was the formulation of a region-wide Water Sector Strategy for the Middle East and North Africa Region, a task that was completed in 1995. This exercise, which involved extensive consultations with clients and partners, was the first of its kind in the World Bank. Building on the Regional Strategy, the MNA Region then took the next logical step, namely “drilling down” the regional strategy into country strategies. This included the formulation of a country water strategy for Yemen (1997), which is, in many ways, also a path breaker, this time for the CWRASs advocated as part of this new Sector Strategy.

224. Given the hydrological, political, economic and social complexity of water management in Yemen, this strategic view was of particular importance and value. The water strategy also succeeded in highlighting the water issue in the government’s development plans and, consequently, in the World Bank’s CAS.

225. Coincident with the formulation of the Yemen water sector strategy, the World Bank supported a set of pilot activities on key issues. These activities were undertaken with a sense that they would be first steps in a long process of learning and adjustment. These first-generation pilot projects included efforts at:

- ≈ Improving the efficiency of water use in agriculture (and, in particular, a focus on reducing “real losses”—water lost through evapotranspiration, rather than “paper losses”—water which percolates down into the aquifer);
- ≈ Reinforcing strong, traditional, community-based management systems for managing flash flood flows in the coastal rivers;
- ≈ Improving the efficiency of urban water supply; and, most important,
- ≈ Starting to address the enormous task of sustainable management of selected aquifers.

226. As emphasized in this Sector Strategy, one of the universal lessons of water reform is that it takes patience and persistence and is only achieved partially over the course of decades (witness the experience of developed countries). When effective management instruments are few (as is the case in Yemen), then even greater modesty, patience and persistence are required. This is always difficult advice to convey, especially given the enormity and immediacy of the problem in Yemen.

227. 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 projects, and from the efforts of others. This is intrinsically a 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.

228. 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, which are both under preparation. These build on the experiences of the first generation activities. They address the major issues, including better integrated management of land and water (through watershed management components); further attention to getting maximum return per unit of evapotranspiration; efforts at improving the legal and institutional framework and selectively improving the capacity of the national water management agency, especially in the area of information and decision-support systems; and helping develop local capacity for resource management. The approach once again will have to be step-by-step, learning and adjusting as the lessons of experience accumulate. But if even partial success can be achieved in the Sana'a Basin, which includes the national capital, this could have a big multiplier effect on the rest of the country.

229. The water resources challenges of Yemen are an extreme case and shed unusually clear light on some of the central strategic questions which face the World Bank in the arena of water management. With respect to the central themes of this Sector Strategy, there are few issues relating to major water infrastructure, but many on minor infrastructure and, especially, the political economy of water resources management.

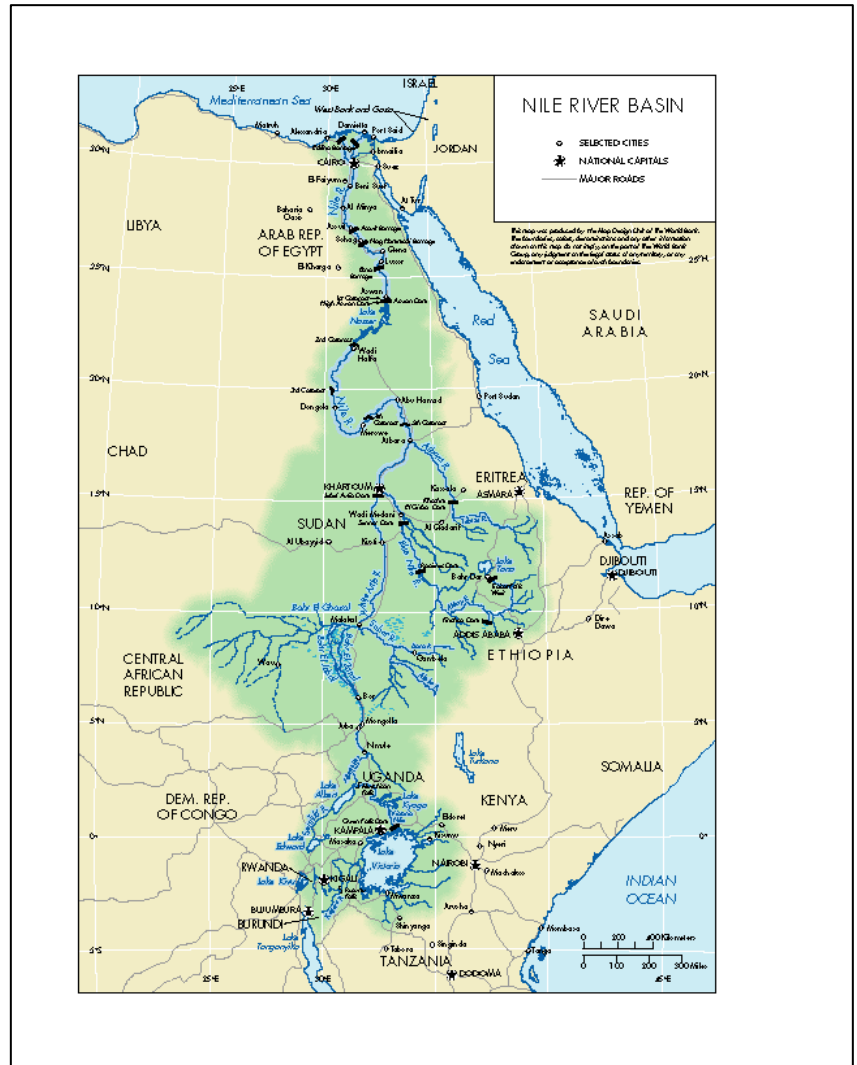
230. Perhaps the greatest challenge is for the World Bank to be realistic about the nature of the challenge and about what change is possible in what time frame. Water management reform ideally derives from underlying factors such as participation and a market economy. While Yemen has made admirable strides in recent years, it still ranks near the bottom of the world tables for these indicators. It is therefore very unlikely that the water sector in Yemen will, in the foreseeable future, look anything like an ideal "Dublin-style" 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 five, ten, or twenty 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 our borrowers "pick the low-hanging fruit," an approach that is essential for building confidence and capacity, but which is easy to characterize as inadequate given the magnitude of the challenge?

231. 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 the 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.**

232. Since 1996, the Africa Water Resources Management Initiative has sought to improve national-level water resources management through institutional and legal review and reform efforts, with particular 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; rainfall variability is roughly three times that of temperate regions but water storage per capita in reservoirs is often orders of magnitude lower than in developed countries. Water resources management capacity and infrastructure investment levels are low; both must be addressed for either to be truly effective.



233. 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 requested to facilitate and support cooperative management of international water resources. These requests reflect the World Bank's capacity both as a knowledge bank with global experience in water resources management, and its capacity as an investment bank to underwrite the investments that will deliver the development benefits of international cooperation.

234. A clear example of the importance of this Strategy for operations in the Africa region is the Nile Basin Initiative. Tensions over the control of Nile waters 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 ten countries that share the Nile River. The NBI is led by the Council of Ministers of Water



Affairs of the Nile Basin States (Nile-COM), supported by a small secretariat based in Entebbe. The NBI'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 basin-wide "Shared Vision Program" of technical assistance-style projects designed to lay the foundation for cooperative action, and two sub-basin investment programs that will promote poverty alleviation, growth and improved environmental management.

235. At the request of the Nile-COM, the World Bank is facilitating discussions among the riparians, backstopping the NBI's technical work, and coordinating international support for both the process of, and the investments identified by, the NBI. The NBI is a cross-regional international water resources program supported by the Africa and Middle East and North Africa Regions of the World Bank. 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.

236. While the overarching goals of the NBI are conflict prevention, poverty alleviation and environmental management—not simply the construction of major water infrastructure—the mutually-agreed projects of the NBI will deliver the most apparent and immediate development impacts of this complex Initiative. 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, the resulting disengagement of the World Bank could undermine the NBI process. World Bank disengagement from investment could erode riparian confidence that their efforts will lead to real development gains, and donor confidence that the NBI investments are sound. Some NBI 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, it is more likely that best practice environmental and social safeguards would be assured with the involvement of donor partners.

237. It is essential that when the World Bank commits to long-term, high-reward/high-risk undertakings like the NBI, it has a clear institutional mandate to fulfill the range of functions—both in terms of policy and investment support—required by such a commitment.

238. This Sector 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—both in its efforts to provide management and institutional support and advice, and in its efforts to finance infrastructure investments. In practice, institutional support and investment finance are often interlinked both in terms of project design and client relations.

### **Implementing the Sector Strategy in the World Bank's operations: What these illustrative examples show**

239. The activities of the World Bank in water resources in any particular country will be the product of three factors: the nature of the water resources challenges in the country and the approach taken by the government; the overall framework governing the relationship between the country and the World Bank (as embodied in the CAS) and, third, this Sector Strategy. Accordingly, the implications of the Strategy for the World Bank's work in any particular country cannot be specified on the basis of this Strategy alone, but will only emerge over time, in response to demand from borrowers and as part of a larger relationship.

240. That said, the examples serve to illustrate how the broad themes of this Sector 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 in appropriate ambition and pace of reform;
  - ? The need to move away from slogans based on principles, and focus directly on issues of political economy. This means close attention to prioritizing and sequencing reform actions, taking advantage of windows of opportunity thrown up 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; and
  - ? 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, then management later," nor the equally unbalanced "management first then development later," but that what is required is a mix of investments in management AND development; and
  - ? That the World Bank must find more effective ways of getting engaged if we are to have a seat at the table and to serve as a full-service advisory and investment partner to developing countries.

241. As described above, this Sector Strategy is the third in a trilogy of World Bank statements on water resources management. The first of these, the 1993 WRMPP, outlines the principles which govern the World Bank's work in water resources. The second, the 2001

OED assessment of experience with implementation of the Policy Paper (“Bridging Troubled Waters”) concludes that the Policy Paper remains valid and germane, but that 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. This Strategy, the third part of the trilogy, builds on the principles of the 1993 Policy Paper and the lessons learned in the OED study, and focuses on how to translate principles into action.

242. These illustrative 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, improvement in resource management is a task that is only partially accomplished, even under the best of circumstances. It requires patience, persistence and realism, greater attention to the prioritization and sequencing of reforms, and the linking of these 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, which focuses primarily on the development risks of not being involved, and which 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 is essential for environmentally and socially sustainable growth, and for the reduction of poverty.

## ACRONYMS

AAA:	Analytic and Advisory
AFR:	Africa Region
ANA:	National Water Agency, Brazil
BNWPP:	Bank-Netherlands Water Partnership Program
BOT:	Build-Operate-Transfer
CAS:	Country Assistance Strategy
CGIAR:	Consultative Group for International Agricultural Research
CODE :	Committee on Development Effectiveness (of the Board of Executive Directors of the World Bank)
CWRAS:	Country Water Resources Assistance Strategy
EAP:	East Asia & Pacific Region
ECA:	Europe & Central Asia Region
ESSD:	Environmentally and Social Sustainable Development Network
ESW:	Economic & Sector Work
EXT:	External Affairs Department of the World Bank
GDP:	Gross Domestic Product
GEF:	Global Environment Facility
IDA :	International Development Agency
IFC:	International Finance Corporation
LCR:	Latin American & the Caribbean Region
MIGA:	Multilateral Investment Guarantee Agency
MNA:	Middle East & North Africa Region
NGO:	Non-governmental Organization
OECD:	Organization for Economic Cooperation and Development
OED:	Operations Evaluation Department
PAD:	Project Appraisal Document
PRSP:	Poverty Reduction Strategy Paper
PSI:	Private Sector & Infrastructure Network
QACU:	Quality Assurance & Compliance Unit
QAG:	Quality Assurance Group
RMT:	Regional Management Team
RVP:	Regional Vice President
SAR:	South Asia Region
UNEP:	United Nations Environment Programme
WBI:	World Bank Institute
WCD:	World Commission on Dams
WDR:	World Development Report
WRMG:	Water Resources Management Group
WRMPP:	Water Resources Management Policy Paper
WSS:	Water Supply & Sanitation
WSSD:	World Summit on Sustainable Development
WUA:	Water Users' Associations

## ANNEX: 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 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 who 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; and
- A set of criteria for assessing compliance and twenty-six 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 non-governmental 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 twenty-six “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/or 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.

*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; and
- 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 which 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; upstream meaningful 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 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 the 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.

*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 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.



*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."

**Washington DC December 13, 2001**

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