
Sustaining Water for All in a Changing Climate

World Bank Group Implementation Progress Report
of the Water Resources Sector Strategy

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WORLD BANK GROUP

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Foreword

As the international community approaches the deadline of the Millennium Development Goals, advocacy and support for advancing the water agenda are more important than ever. This sector faces profound challenges. About 900 million people do not have access to improved drinking water sources. Another 2.5 billion people do not have access to improved sanitation. By 2015, it is likely that one billion people will miss the Millennium Development Goal for sanitation. As three billion people are added to the planet by 2030, access to water for producing food will be one of the main challenges in the decades to come. Adding to the complexity, access to water will need to be balanced with the importance of managing this resource in a sustainable way, taking into account the impact of climate change, and other environmental and social variables.

The World Bank's vision for the water sector was articulated in the Water Resources Sector Strategy in 2003. In many ways, the Strategy was ahead of its time in raising many issues which are now gaining wider international attention, such as climate change and rapid urbanization. The Strategy presented water as an integrated sector that linked water resources with water use. This integrated approach changed the Bank's vision for the sector, moving away from a sector-based to a multi-sectoral approach. Under this framework, water resources infrastructure and management are seen as beneficial not only for economic development, but also for poverty

reduction, and thereby instrumental in achieving the Bank's core mission.

Looking at seven years of strategy implementation, this report shows that the World Bank Group has responded at scale to this growing agenda. The World Bank Group's water lending commitments increased significantly, the quality of the water portfolio was turned around, and the outcome project rating now even outperforms the Bank average. Bank assistance has been going towards those countries with the greatest water needs. What is more, the Bank re-engaged in large and complex hydraulic infrastructure projects, while continuing to support client countries in water resource management.

This report places water at the core of the World Bank Group's mandate on sustainable development. Going forward, it is critical to position water at the core of the adaptation and mitigation solution to climate change. Also, guaranteeing increased food security will require addressing the water-agriculture nexus. Finally, providing access to water services, including sanitation, will continue to be an essential requirement to fulfill our dream of a world without poverty. The World Bank Group is committed to using its financing, knowledge and convening power to mobilize the international community around this vital agenda.

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Abbreviations and Acronyms

AAA	Analytic and Advisory Activities		Reconstruction and Development
ADB	Asian Development Bank	ICR	Implementation Completion and Results Report
AFR	Africa Region		
APL	Adaptable Program Loan	IDA	International Development Association
BNWPP	Bank-Netherlands Water Partnership Program	IE	Impact Evaluation
CAS	Country Assistance Strategy	IEG	Independent Evaluation Group
CDD	Community Driven Development	IFC	International Finance Corporation
CPS	Country Partnership Strategy	IFI	International Financial Institutions
CVI	Climate Vulnerability Index	INFRA	Infrastructure Recovery and Assets Platform
CWRAS	Country Water Resources Assistance Strategy	IP	Inspection Panel
DIME	Development Impact Evaluation	IPCC	Intergovernmental Panel on Climate Change
DPL	Development Policy Loan		
EAP	East Asia and Pacific Region	IsDB	Islamic Development Bank
ECA	Europe and Central Asia Region	IWRM	Integrated Water Resources Management
ESSD	Environmentally and Socially Sustainable Development	LCBC	Lake Chad Basin Commission
ESW	Economic Sector Work	LCR	Latin America and Caribbean Region
FY	Fiscal Year	MCIPR	Mid-Cycle Implementation Progress Report
GDP	Gross Domestic Product		
GEF	Global Environment Facility	MDG	Millennium Development Goal
GFCRP	Global Food Crisis Response Program	MIGA	Multilateral Investment Guarantee Agency
GFDRR	Global Facility for Disaster Reduction and Recovery	MNA	Middle East and North Africa Region
GHG	Green-House Gas	MUWFs	Multi-use water facilities
GDP	Gross Domestic Product	NBA	Niger Basin Authority
GPOBA	Global Partnership for Output-Based Aid	NBI	Nile Basin Initiative
GW-Mate	Groundwater Management Advisory Team	NGO	Non-governmental organizations
HNP	Health, Nutrition & Population	O&M	Operation and Maintenance
HR	Human Resources	OBA	Output-Based Aid
HRHR	High reward/high risk	ODA	Official Development Assistance
I&D	Irrigation and Drainage	OECD	Organization for Economic Co-operation and Development
IAP	Infrastructure Action Plan	OP	Operational Manual
IBRD	International Bank for	OPCS	Operations Policy and Country Services
		PER	Public Expenditure Review

PPIAF	Public Private Infrastructure Advisory Facility
PPP	Public-Private Partnership
PRSP	Poverty Reduction Strategy Paper
QAG	Quality Assurance Group
RBOs	River Basin Organizations
SAL	Structural Adjustment Loan
SAR	South Asia Region
SDN	Sustainable Development Network
SEA	Strategic Environmental Assessment
SF	Special Financing
SFDCC	Strategic Framework for Development and Climate Change
SIAP	Sustainable Infrastructure Action Plan
SSA	Sub-Saharan Africa Region
SSIU	Sector Strategy Implementation Update
STC	Short Term Consultant
SWAPs	Sector Wide Approaches
SWAT	Sanitation, Hygiene and Wastewater Support Service
UNICEF	United Nations Children Fund
WB	World Bank
WB	World Bank (IBRD/IDA)
WBG	World Bank Group
WDR	World Development Report
WQMA	Water Quality Management Areas
WQMF	Water Quality Management Fund
WRM	Water Resources Management
WSS	Water Supply and Sanitation
WUA	Water User Association
WWF	World Wildlife Fund



Executive Summary

Water is essential to sustain life and economic development, and the livelihoods of the poorest people are critically associated with access to water services. The sustainable management of water resources has acquired a new urgency in the face a global population expected to reach nine billion by 2050, economic development spurring demand for more and better food, and increased hydrological variability caused by climate change. *Sustaining Water for All in a Changing Climate* reaffirms the strategic directions for the World Bank Group's approach to supporting water resources management.

Countries that borrow from the World Bank Group (WBG) must provide clean drinking water and good sanitation to their citizens, ensure sustainable irrigation, use hydropower to produce electricity, and maintain diverse ecosystems. They must prepare for and respond to droughts and floods, while also working with neighboring countries to manage trans-boundary water resources. Decisions about water resource management are further complicated by the lack of reliable information about water availability, the quantity being used, and the impact of today's actions on tomorrow's resources. All countries face these challenges, but the developing world is particularly at risk.

Food security, hit by price shocks in 2008, remains dependent on agriculture which is, by far, the largest consumer of water—as much as 90 percent of water use in some countries. With more turbulent weather, including more frequent droughts and flooding due to climate change, that urgency and complexity of integrated water resource management is greater than ever. This report finds that both governments and the WBG need to break down barriers between ministries, departments, public and private sectors, and the communities they serve, to integrate efforts in the water sector. A symptom of the failure to do this, thus far, is the reality that the Millennium Development Goal for sanitation will not be met by 2015.

This report places water at the forefront of the WBG mandate for sustainable development. It describes WBG achievements in the water sector since 2003, identifies challenges, and defines how to move forward. To date, WBG efforts have been guided principally by the Water Resources Sector Strategy, aimed at helping countries improve water resources management and development for sustainable growth and

poverty reduction. The report concludes that the existing strategy's principles should be retained at the core of future work. It also defines the changes needed to respond effectively to the more complex challenges now facing water resource management.

Achievements and Lessons Learnt over FY03-09. The Strategy has provided a solid overarching framework to guide Bank assistance in the water sector; the recent IEG evaluation on World Bank support for water identified achievements in each of the 23 strategic objectives of the Strategy.

To respond to a growing agenda, World Bank Group assistance to the water sector, led by the International Development Association (IDA) and the International Bank for Reconstruction and Development (IBRD) was significantly scaled up from FY03-09, and annual commitments increased from \$1.8 billion to \$6.2 billion. Overall, Bank assistance was directed toward those countries that face the greatest water needs, and the sector outperformed the Bank-wide average in terms of quality of lending. However, this support was provided primarily through the public sector. It has been difficult to attract the private sector to water-related projects, as evidenced by the relatively low levels of investment by International Finance Corporation (IFC) and the Multilateral Investment Guarantee Agency (MIGA) in water.

The Bank re-engaged in infrastructure as a priority area. Infrastructure development is critical for improved access and storage of water, as well as for protection from floods and droughts. Physical infrastructure has often been an easier entry point for dialogue with client countries than water resources management; however, the Bank has continued to support management

reforms, despite benefits that take longer to materialize. In addition, policy reform in Governance and Anti-Corruption (GAC) issues have received increased attention over the past several years.

In spite of high-reputational risks, the Bank increased its investments in large and complex hydraulic infrastructure projects. Such projects require a long-term engagement by the Bank that goes beyond the traditional timeframe of projects. By their sheer complexity, these projects have pushed the Bank's approach beyond ensuring the compliance to safeguards.

Through its engagement in large infrastructure, the Bank gained knowledge and experience in dealing with the reputational risks which compromised project development in the 1990s. This knowledge was a catalyst for the formulation of the Bank's safeguard Operational Policies. In addition, the Bank invested significant resources in building sector knowledge. New analytic instruments, such as Country Water Resources Assistance Strategies (CWRAS), Water Public Expenditure Reviews (PERs) and the recent IFC/McKinsey instrument have been developed to support engagement and holistic dialogue with client countries on water issues.

Bank projects have made some progress in adopting a multi-sectoral approach to water resources management. More projects systematically linked the availability of water with its use; water was mainstreamed in environmental, social, poverty and health projects. But these cross-sectoral projects are more complex and costly, and take longer to design and implement than traditional sector projects. The current internal incentives system still favors independent sectoral outcomes over cross-sectoral results. Another constraint has been the institu-

This report places water at the forefront of the World Bank Group mandate for sustainable development. It concludes that the principles of the Strategy are still very much at the core of future work, and defines what changes are needed to respond effectively to the complexities of the rapidly changing environment.

tional settings and governance structures of most client countries, which do not encourage integrated planning, development, and management of water resources.

Since water transcends political boundaries, the Bank has facilitated cooperation in international rivers and trans-boundary issues. Its efforts focused on upstream analytic work and technical assistance to better understand the political economy of trans-boundary engagement, environment and local development activities for short-term benefits, and large infrastructure investment programs for long-term benefits. While collective action for sustainable management of trans-boundary resources requires considerable time and efforts from all involved parties, inadequate attention to trans-boundary issues can harm livelihoods, undermine growth, and exacerbate resource-based conflicts.

Strategic Directions for the World Bank Group, FY10–13. For FY10–13, WBG water commitments, led by IDA and IBRD, are projected to be between \$21 and \$25 billion. The Bank will continue to support infrastructure. However, these projects will take a more integrated approach, linking water services with water resources. The Bank will favor irrigation projects that integrate water productivity, and water supply projects that link water use to resource management, over stand-alone irrigation and water supply projects. Water will also be increasingly mainstreamed in projects of other sectors, including environment and energy. However, the actual mix will depend on clients demand and country strategies. Finally, improving client countries' access to technologies, such as remote sensing and early flood warning systems, will be critical to increase the availability and dissemination of information for results-based decision making.

The Bank will continue to support infrastructure. These projects will, however, take a more integrated approach, linking water services with water resources. Improving client countries' access to technologies will also be critical to increase the availability and dissemination of information for results-based decision making.

The Strategy was forward looking, anticipating the issues of climate change and rapid urbanization before they were at the forefront of global discussion. But the external environment is rapidly evolving and the water agenda is becoming more complex, requiring the WBG to be flexible and responsive to new challenges and opportunities. The Bank responded by developing a new results framework of the Strategy, which will help to monitor progress as the Strategy is implemented over FY10–13.

Adapting to increased climate variability will require better information and a more integrated approach towards water resources management. Efforts towards climate change mitigation will be paramount in WBG investments and engagements going forward. The WBG will scale up support for hydropower as the largest source of renewable and low-carbon energy, and look for energy efficiency opportunities in water supply systems.

Ensuring regional food security has become increasingly challenging given the volatile global food market. Supported by the recent World Bank Group Agriculture Action Plan, the WBG will increase its assistance to agricultural water management, giving more attention to both expanding irrigated areas where feasible, and improving water use efficiency of existing schemes. Support for rainfed agriculture will focus on improved water control, including broader watershed management. These efforts will become even more critical as climate change affects drought incidence.

Almost 39 percent of the world's population, or over 2.6 billion people, live without improved sanitation facilities, and the international community will miss the 2015 sanitation MDG by almost one billion people. The Bank will put the full extent of

its instruments to support this issue. In addition to using lending, the Bank will work together with partners and governments to ensure that critical policy dialogue and technical assistance support global progress towards the MDGs.

To translate this vision for the water agenda into action, the Bank will continue to combine traditional and innovative financing and knowledge instruments. Experience of water PERs will be assessed from the perspective of enhancing their effectiveness in engaging client countries on the allocation of fiscal resources to the water sector and financing of water services. This work, in conjunction with the lessons learned on cost recovery from past projects, will support policy discussions on the efficiency (and conservation) of water use under way. To strengthen the link between CWRAS and Country Assistance Strategy (CAS), the Bank will develop a rapid assessment tool to be used to feed into the CAS and Country Economic Memorandum (CEM) discussions before undertaking a CWRAS. Work will continue to define how the WBG/McKinsey instrument can be applied in specific countries to support policy or lending initiatives of key strategic importance. Political economy analysis will be used more systematically to support sector engagement in transboundary and GAC issues. The WBG will explore opportunities presented by private finance, including guarantees, mobilizing private financing for water utilities, and reforming public water utilities to improve their financial management through corporatization and similar structural efforts.

In response to the mounting water resource challenge, the Bank will address staffing to ensure the availability of appropriate expertise through strategic batch recruiting, expert support teams, and stra-

tegic secondments. It is expected that global expert teams will operate as integrated, Bank-wide entities capable of recruiting and developing the best talent, managing knowledge and dissemination across the Bank, and strengthening the networks with key knowledge centers across the world.

The Bank will continue to engage at the corporate level on regional and global issues that cannot easily be tackled by the country-based approach, such as water-sharing arrangements in international river basins and engagement in major dams, as well as on more specific issues, such as drainage of peat land.

Finally, the Bank will continue to seek new ways to promote cross-sectoral outputs. Balancing these projects with more traditional projects will be critical, given their higher cost and longer time-frame to deliver results. The Bank has been experimenting with various approaches to encourage inter-sectoral cooperation and to promote the delivery of cross-sectoral outputs. The lessons learned from these pilots will contribute to the institutional reform effort under way. The WBG's vision is to develop more flexible ways of working across sectors and respond more effectively to a complex, rapidly evolving environment.

The Bank's Committee on Development Effectiveness endorsed these strategic directions for the sector on May 26, 2010.



Part 1

Context

Water features prominently in everyday life. On the front page of a major newspaper, one article focuses on the flooding in Mumbai, India while another describes how droughts in Kenya are forcing energy rationing in Nairobi.¹ On another day, the front pages tell us how unbridled irrigation causes groundwater levels in Northern India to fall rapidly, and how pollution in the Black Sea causes algal blooms that suffocate fish. Ensuring the availability of water, harnessing its productive potential, and limiting its destructive impacts have been the most critical issues faced by all societies.

1. Issues

Meeting the growing demand for water services, while managing water in a sustainable way is the challenge of the sector.

Water is a scarce resource that has a multitude of interdependent uses (irrigation, drinking water, sanitation, energy and environmental services). At a global scale, access to water services is not guaranteed. More than one-sixth of the world's population does not have access to safe drinking water (80 percent of whom live in rural areas). And 39 percent of the world's population does not have access to improved basic sanitation. If the current trend continues unchanged, the international community will miss the Millennium Development Goals (MDG) sanitation target for 2015 by almost one billion people.² Access to electricity, where hydropower could play a role, is not a reality for 1.5 billion people; access to water for producing food will be one of the important challenges the world will face, when 2.3 billion people will be added to the planet by 2050 (see Box 1). All these services put significant pressure on this finite resource, making its sustainable management critically important.

By adding uncertainty, climate change will increase the complexity of managing water resources. Adapting to hydrological variability and scarcity has always been part of the challenge of water resource management. Climate models project that climate change will intensify and accelerate the dynamics of the hydrological cycle. In some parts of the world, there will be more available water but in other parts, including in most of the developing world, there will be less.³ In some highly populated areas, such as parts of Africa, South Asia, and East Asia, both averages and extremes will change. Much of the developing world will

have to cope with droughts and/or the growing risk of flooding.

By forcing researchers to adopt a long-term perspective on development issues, the climate change debate has re-emphasized the centrality of water for sustainable development. Water resource management must follow a sustainable development path that achieves human well-being without exceeding the earth's capacities for natural resource generation and waste absorption.⁴ The challenge is to manage the social, political, and institutional processes of balancing the water use of present generations with the needs of future generations.⁵

Adapting to climate variability will require hard and soft actions; many are related to the water sector. Many water-dependent sectors will be affected by climate change.⁶ Agriculture in a few areas in the world will benefit from climate change, but in most developing countries agriculture will suffer. Coastal zone management, water supply, and infrastructure rank as the top three adaptation costs of climate change, totaling between 72 and 82 percent of costs depending on the climate scenario. Increases in water-borne disease, casualties from flooding, and malnutrition will contribute to the human health impacts of climate change. Adapting to a future world with a changed climate will entail not only investing in water-related infrastructure but also strengthening institutions that govern water use.

Managing water and land in a more integrated way is critical to addressing water supplies, water pollution control, flooding, and food security, as well as emissions from natural and man-made ecosystems.

As the world population is projected to sur-

pass 9 billion people by 2050 and societies grow wealthier,⁷ countries will need to get more from their agriculture and water use. Feeding 2.3 billion more people and coping with the changing dietary demands from a richer population will require more efficient water use, particularly in agriculture.⁸

Leveraging the power of water to support the transformation of the energy sector will help to mitigate the effects of greenhouse gas emissions. Hydropower accounts for 20 percent of the world's electricity supply and 88 percent of the supply from renewable resources. Only 23 percent of the hydropower potential has been exploited in developing countries. Countries in the Africa region (AFR) store only about 4 percent of annual renewable flows, compared with 70 to 90 percent in many developed countries.⁹ Hydropower has a dual role in adaptation and mitigation, as the largest source of affordable renewable energy and as a low-carbon fuel source. Taking the links between water and energy into account will be essential for dealing with both mitigation and water scarcity.¹⁰

Rapid urbanization and increased density of cities, fuelled by migration from rural areas, will exacerbate the urban-rural tensions for water, adding a spatial dimension to the challenge of managing water appropriately. Urban population is expected to double between 2000 and 2030. With a growing share of population living in cities, competition between agricultural and urban water users will increase, calling for integrated urban water management as well as improved river basin management; increasingly scarce water resources will need to be allocated, and pollution of surface and groundwater bodies in urban areas will need

TABLE 1
ANNUAL COSTS OF ADAPTATION, 2010–2050

US \$ Billions		
Sector	Climate Scenario	
	Dry	Wet
Agriculture, Forestry, Fisheries	7.3	7.6
Water Supply	18.8	13.7
Human Health	1.6	2.0
Coastal Zones	29.6	30.1
Infrastructure	13.7	29.5
Extreme Events	6.5	6.7
Total	77.6	89.7

2005 Constant Prices. 0% Discounting

Source: Economics of Adaptation to Climate Change Study, World Bank, 2009

to be controlled. Coastal areas, in which 18 of the world's 27 megacities are located, will face the largest migratory pressures; many will also be hot spots of climate change impacts. The combination of sea level rise, increased intensity of rainfall, more frequent and more serious floods and droughts, and possible increased incidence of cyclones, will call for more attention to this freshwater-coastal linkage.

With added pressure on the already stressed and vulnerable water resources in many regions of the world, can the ecosystems that support biodiversity and the livelihoods of the poor be sustained? There

BOX 1 MONITORING WATER OUTCOMES

Indicators	Baseline Data	Recent Data
Water Quality		
Emissions of organic pollutants (not aggregate)	By country	By country
Sustainability of Water Resources		
Surface water and groundwater withdrawal as percentage of total actual renewable water resources	n/a	3.2% (2007)
Water Supply and Sanitation		
Access to an improved water source (% of population)	72% (1990)	84% (2006)
Access to improved sanitation facilities (% of population)	44% (1990)	55% (2006)
Irrigation and Drainage		
Irrigated land (% of cropland)	20.0% (1990–1992)	20.4% (2003–2005)
Hydropower		
Electricity production from hydroelectric sources (% of total)	23.5% (1990)	21.5% (2006)
Note: Water outcome indicators do not lend themselves well to standardized reporting, as definitions are inconsistent and data is often unable to be aggregated or compared across regions or geographies.		

Source: World Development Indicators, 2009

is a growing recognition that functionally intact and biologically complex freshwater ecosystems provide many economically valuable commodities and services to society (ecosystem services) beyond simply direct water supply. These services include transportation, recreation, purification of human and industrial wastes, habitat for plants and animals, and production of fish and other foods and marketable goods. These ecosystem benefits are valuable and often impossible to replace or costly to redress when aquatic systems are degraded.

The economic benefits of managing water resources adequately are large, as are the economic costs of inaction. Country examples indicate that proper water management could increase gross domestic product by 5 to 14 percent—an impact that may be unachievable through any other interventions.¹¹ Cambodia, Indonesia, the Philippines, and Vietnam lose an estimated 2 percent of GDP from under-investment in sanitation.¹² What is more, the costs of disasters as a share of GDP are much higher in poor countries than rich countries—14 percent of GDP compared to 3 percent of GDP—as poorer countries are often less well equipped to cope with disasters such as floods and droughts.¹³ The cost of environmental degradation from water pollution and excessive withdrawals has been estimated between 2 and 7.4 percent of GDP in the Middle East and North Africa region (MNA).¹⁴

The nature of water as a fundamental public good makes its control and management a sensitive political economy issue. Water security has become a greater concern in many client countries as the result of population growth, droughts, climate change, and over-extraction of groundwater. Relying

on trade to meet the growing demand for food to save water (often known as “virtual water”) often imposes a politically untenable burden on economies. The geopolitical dimension of water is further exacerbated by its trans-boundary nature: about one-fifth of the world’s renewable freshwater resources cross or form international borders, and in some regions, particularly in developing countries, the share is far higher.

2. The Water Business in the World Bank Group

Supporting the provision of water services necessary for development, while ensuring the sustainable management of this scarce resource, has been at the core of the World Bank Group assistance on water. In FY09, the World Bank Group (WBG)’s active water portfolio amounts to \$21 billion. From FY03 to FY09, the WBG annual commitments increased from \$1.8 billion to \$6.2 billion, with about three-quarters to support water supply and sanitation. This increase followed a period of consistent decline during the 1990s, which can be attributed to both an overall reduction in WBG commitments and a shift away from infrastructure lending. The WBG Infrastructure Action Plan,¹⁵ followed by the Sustainable Infrastructure Action Plan¹⁶ and the Infrastructure Recovery and Assets Relief Platform, played a critical role in reviving the WBG’s business in infrastructure in general, and the water sector in particular. WBG commitments for water increased by 79 percent over the FY03–09 period relative to the FY96–02 period.¹⁷ The share of International Bank for Reconstruction and Development (IBRD) and International Development Association (IDA) lending to water in total commitments increased from 5 percent in FY02 to 11 percent in FY09.

World Bank Group lending increased across subsectors. In line with the development community's push to achieve the MDGs¹⁸, IBRD/IDA lending for water supply and sanitation increased from \$6.5 billion from FY98–FY03 to \$13.9 billion from FY04–FY09. In spite of the overall retreat of the Bank from the agricultural sector in the 2000s, lending for irrigation and drainage increased from \$2.6 billion to \$4.3 billion over the same period. Significant regional variations exist. In South Asia Region (SAR), for example, lending for the rehabilitation of large irrigation systems increased while most regions continued to support management reforms, through water user association, stakeholder participation, and other institutional reforms. Support for water resource management increased from \$4.9 billion to \$9.6 billion over the same period. IFC commitments in the water sector increased from \$78 million in FY03 to \$748 million in FY09.

Analysis of the lending and patterns of practice by region shows that the Africa (AFR) and Latin America and Caribbean (LCR) Regions led in numbers of projects approved. Projects tended to be larger in the South Asia (SAR) and East Asia and Pacific (EAP) Regions, and those regions led in aggregate borrowing along with LCR. Though AFR led in number of projects, it was fourth in amount of lending, indicating that projects tended to be small, possibly due to limited IDA lending envelope for individual African countries and limited absorptive capacity.

While the Bank Group has engaged across the whole spectrum of clients, it has expanded its support to IDA countries significantly. The concentration of lending activity in India and China skews the Bank's water lending towards IBRD/middle-income countries,

which in total received 76 percent of the new water lending commitments over the FY03–09 period. However, water lending to IDA countries has increased by nearly 80 percent when comparing the FY03–09 period and FY96–02 period. Total IDA lending for water increased in some regions more than others; IDA support for water was significantly increased in AFR and MNA. IFC water and hydropower investments in AFR, MNA, and SAR have totaled \$797 million in the FY03–FY09 period.

While the volume of water lending has remained relatively concentrated with a few large borrowers, new borrowers have joined the pool of large IBRD borrowers since 2003. Over the FY96–02 period, only five countries (China, India, Pakistan, Indonesia, and Brazil) borrowed more than \$500 million for water. Since 2003, the level of lending concentration has declined, with new clients joining the pool of "large" borrowers, such as Argentina, Vietnam, Mexico, Colombia, and Azerbaijan. IBRD/IDA lending for water to the top 5 borrowers accounted for 37 percent of total water lending over the FY03–09 period compared to 51 percent over the FY96–02 period.

The bulk of the assistance for water has been directed towards those countries that rank highest on the water poverty index.¹⁹ At the aggregate level, prioritization of water in total IBRD/IDA supported activities is noticeable. Nearly two-thirds of the IBRD/IDA's active water portfolio is directed towards the most water-poor countries. As of December 2009, active commitments in the water sector amounted to \$10.6 billion in the most water-poor countries, compared to only \$6.2 billion in the least water-poor countries. What is more, water constitutes about 16 percent of the entire active portfolio in water-poor countries, compared to only

FIGURE 1 WORLD BANK GROUP COMMITMENTS IN WATER-RELATED SECTORS, FY96–FY09

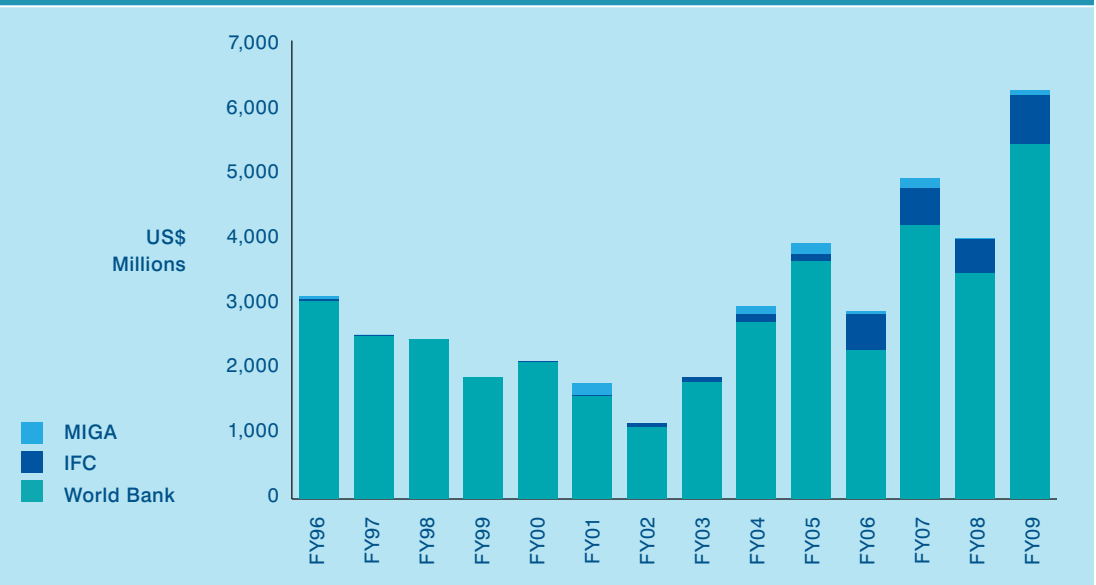
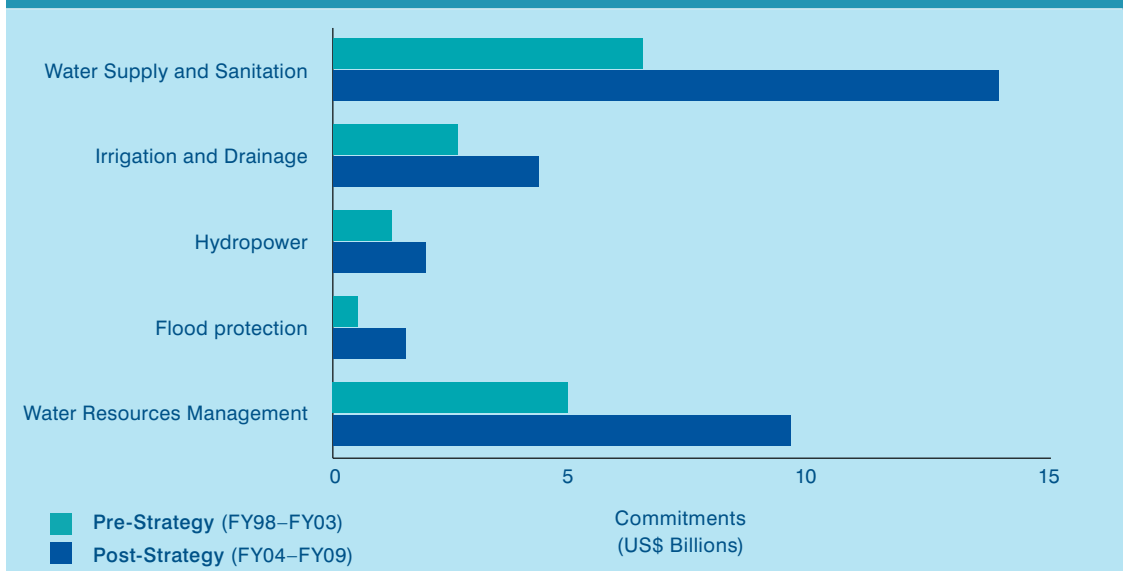


FIGURE 2 IBRD/IDA WATER LENDING PRE/POST WATER STRATEGY (BY SUB-SECTOR)



Source: (Figure 1) World Bank Group (Figure 2) World Bank

FIGURE 3 CUMULATIVE IBRD/IDA WATER COMMITMENTS BY REGION, FY03–FY09

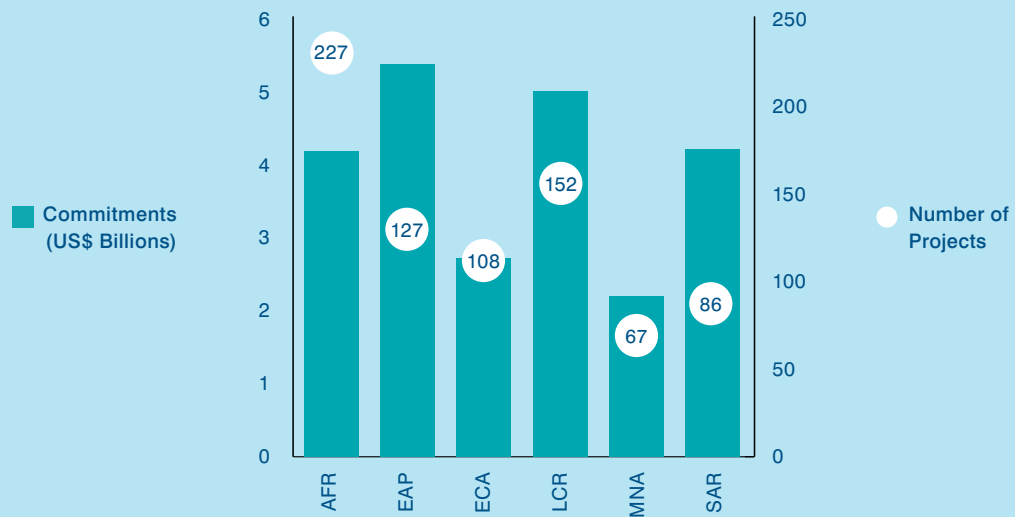
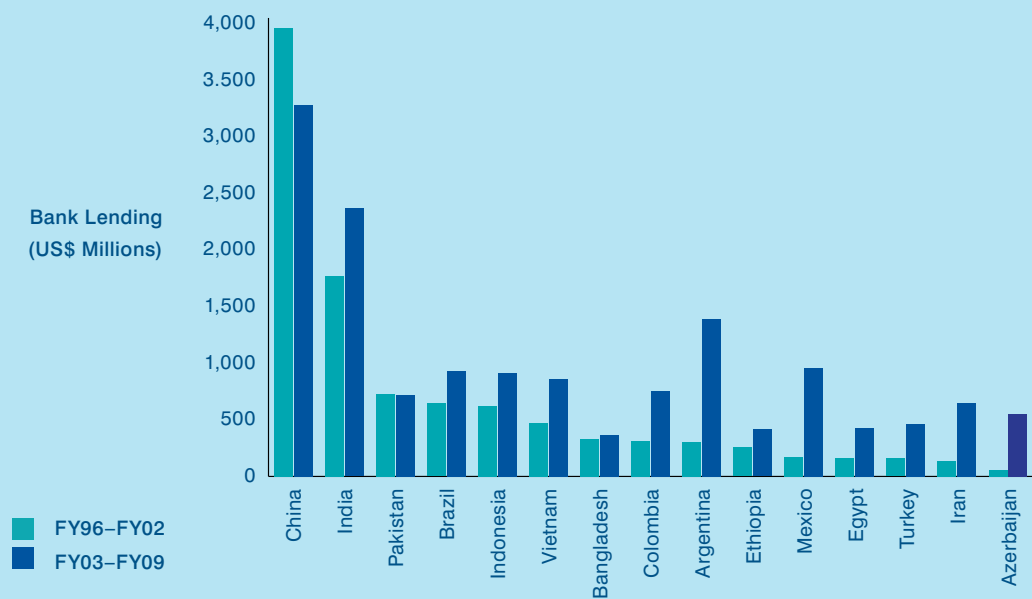


FIGURE 4 WORLD BANK WATER LENDING TO 15 LARGEST BORROWERS, FY96–FY09



Source: World Bank

10.5 percent in non-water poor countries.²⁰ Lastly, nearly three-fifths of the Bank’s economic and sector work, and non-lending technical assistance, in the water sector was directed towards the water-poor countries. This work helped to reposition water at the core of the development agenda in the most water-poor countries.

Since 2003, the outcome ratings of almost all types of water projects have improved, reaching 100 percent satisfactory in 2008.²¹ The most improved sub-sectors were rural sanitation, and water supply and sewerage, which had the highest ratings. Among the highest outcome ratings were projects involving floods, groundwater, and coastal zones. When broken down by region, project performance improved steadily against stated objectives, led by notable project performance in AFR. Prior to FY03, the water sector had generally below average performance, with urban water supply, sewerage, and sanitation performing worse than other water-related projects. Over the FY03–09 period, the water sector generally outperformed the Bank-wide average in a number of quality indicators: it had a consistently lower percentage of projects at risk over the period, and until recently, has exceeded Bank targets for realism and pro-activity.

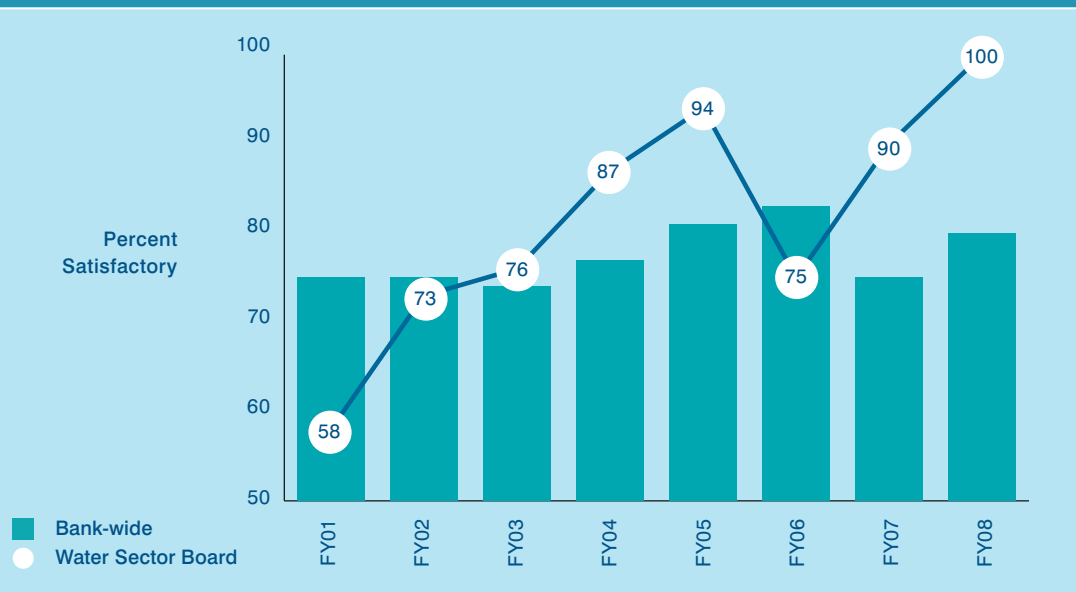
The Bank has delivered knowledge, with global programs and partnerships playing a key role in certain focus areas. From FY03–09, 176 pieces of economic and sector work (ESW) on water were delivered to 106 countries, representing 4.2 percent of Bank-wide ESW. About 70 percent of all water-related ESW directly supported dialogue and lending in client countries, while remaining activities focused on regional issues or knowledge generation. While

there has been a steady decline in the amount of ESW Bank-wide, the water sector has maintained a relatively stable share. Since FY06, there has been a noticeable shift in the sector and Bank-wide in the delivery of knowledge to client countries, with non-lending technical assistance (short policy notes) becoming more frequently used than ESW. Global programs (such as the Water Sanitation Program, Public-Private Infrastructure Advisory Facility, Global Partnership on Output-based Aid, and Bank-Netherlands Water Partnership Program) finance 86 percent of ESW and TA.

3. Scope and Methodology of the Report

The World Bank Group Implementation Progress Report focuses on the Water Resources Sector Strategy and its implementation.²² The Bank’s strategic vision for the water sector is principally guided by the 2003 Water Resources Sector Strategy, which builds on the 1993 Water Resources Policy Paper.²³ International Finance Corporation (IFC) activities have been guided by the IFC Water Strategy Update.²⁴ This report reviews progress in implementing the Strategy over the FY03–09 period and examines the relevance of the Strategy to respond to client needs in today’s context. It also reports on IFC and Multilateral Investments Guarantee Agency (MIGA) activities in order to provide a comprehensive picture of the WBG’s response to the water challenges. Building on these achievements and lessons learnt, the report defines the WBG strategic directions for the sector over FY10–13. Annex A illustrates how the Strategy was implemented on the ground in seven cases

FIGURE 5 IEG PROJECT OUTCOMES RATING BY SECTOR BOARD, FY01–FY08



Source: Independent Evaluation Group

highlighted by the Strategy (Brazil, Central Asia, Andhra Pradesh, Nigeria, Philippines, Yemen, Nile Basin).

The report draws on several desk reviews, including the active water portfolio, completed projects, water development policy lending (DPL) projects, analytic and advisory activities (AAA), Country Water Resources Assistance Strategies (CWRAS), and sector staffing/skills. Findings from these reviews were complemented with those from the recent Independent Evaluation Group (IEG) evaluation of World Bank water projects.²⁵ The Bank team conducted consultations with more than 40 staff and managers from within and outside the water practice to identify the

lessons learned from the strategy implementation and strategic directions for the sector.

The recent IEG Evaluation of water projects provides a useful input for the report. The Strategy was devised to respond to the recommendations of 2002 evaluation on water by the Operations Evaluation Department.²⁶ That evaluation recommended the Bank make further progress in integrating social and environmental concerns into water projects. In a new evaluation of Bank water projects in 2009, IEG concluded that the Strategy for the water sector has been broadly appropriate, and that achievements have been made under each of the 23 strategic objectives of the Strategy.

Endnotes

1 New York Times, July 14, 2009.

2 The target estimates that 71 percent of people in the developing world to have access to improved sanitation facilities. *WHO/UNICEF JMP Report on Progress on Sanitation and Drinking Water—2010 Update Report*.

3 *Water and Climate Change: Understanding the Risks and Making Climate-Smart Investment Decisions*, World Bank, 2009.

4 By acting under the principles of sustainable development, economic considerations become accountable both to an environment/ecological imperative to protect the ecosystem, and to a society equity imperative to create equal access to resources and minimize social suffering.

5 *Beyond WRM—unbundling water management in MNA Countries*, Jagannathan V, et al, 2009.

6 *The Costs to Developing Countries of Adapting to Climate Change. New Methods and Estimates. The Global Report of the Economics of Adaptation to Climate Change Study (Consultation Draft)*, 2009.

7 UN population estimates and projections. Most of the additional 2.3 billion people will enlarge the population of developing countries, which is projected to rise from 5.6 billion in 2009 to 7.9 billion in 2050

8 *World Development Report 2010: Development and Climate Change*, World Bank, 2010.

9 *World Water Development Report 3: Water in a Changing World*, United Nations, 2009.

10 Conversely, desalination and wastewater reuse, which could increase the supply of water, will require considerable energy and fuel the carbon cycle, unless technological innovations are adopted.

11 *World Water Development Report 3: Water in a Changing World*, United Nations, 2009.

12 *Economic Impacts of Sanitation in Southeast Asia*, World Bank, Water and Sanitation Program, 2007

13 *World Water Development Report 3: Water in a Changing World*, United Nations, 2009.

14 *Making the Most of Scarcity: Accountability for Better Water Management Results in the Middle East and North Africa*, World Bank, 2009.

15 *World Bank Group Infrastructure Action Plan*, World Bank, 2003.

16 *World Bank Group Sustainable Infrastructure Action Plan, FY09–11*, (CODE2008–0028, March 21, 2008).

17 World Bank Group commitments include World Bank commitments (IBRD, IDA, GEF, carbon financing, special financing, guarantees and recipient-executed activities), IFC commitments, and MIGA commitments.

18 From 2000 to 2006, the proportion of people in the developing world with access to improved sanitation facilities grew from 49 percent to 53 percent (2015 target = 71 percent). In terms of access to clean drinking water, it grew from 79 percent to 84 percent (2015 target = 86 percent). See *Millennium Development Goals Report* (2008).

19 IEG uses the water poverty index to categorize countries by “water stress” level. The WPI composite index captures the resources, access, capacity, use, and environment dimensions (*The Water Poverty Index: an International Comparison*, L. Peter, M. Jeremy, and Sullivan C. Keele Economics Research Paper, 2002).

20 As a share of approved and completed projects over FY97–07, the share is 14 percent in water-poor countries and 9 percent in non-water poor countries. The correlation coefficient between the WPI and water lending as a share of the country’s total lending is 0.35 in water-poor countries.

21 *Annual Review of Development Effectiveness 2009: Achieving Sustainable Development*, IEG, 2009.

22 *Water Resources Sector Strategy Mid-Cycle Implementation Progress Report – Issues and Concept Note* (CODE2009–0071, August 5, 2009).

23 *Water Resources Sector Strategy*, World Bank, 2003; *Water Resources Management Policy Paper*, World Bank, 1993.

24 *IFC Water Sector Update* (OM2008–0084, November 2008).

25 *Water and Development: An Evaluation of World Bank Support, 1997–2007* (CODE2009–0106, December 2009).

26 *Bridging Troubled Waters*, Operations Evaluation Department, 2002.

A large, high-resolution image of a water splash, rendered in shades of blue and teal. The splash is dynamic, with many droplets and bubbles visible. It is positioned on the left side of the page, partially overlapping a dark blue horizontal band.

Part 2

Water Resources Sector Strategy

Part II reports on achievements and lessons learnt from the implementation of the Strategy over the FY03–09 period. It also addresses findings of the recent IEG evaluation on water projects and goes further than the evaluation in terms of scope of analysis by considering all Bank instruments as well as the contributions of IFC and MIGA.

1. Strategic Vision for Water Resources in 2003

The Water Resources Sector Strategy, supported by the WBG Infrastructure Action Plan (IAP), helped to reposition infrastructure at the top of the Bank's development agenda.

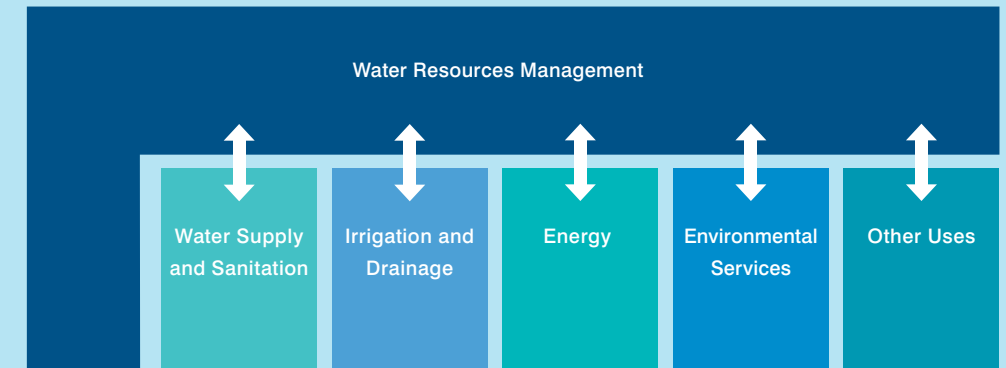
During the 1990s, the Bank's commitments to infrastructure sharply declined, reaching a low level of \$5.2 billion towards the end of the decade. This de-emphasis on infrastructure was in part deliberate—the result of pressures to disengage from large and complex infrastructure projects and the belief that the private sector could provide the bulk of the financing—but was also the result of an institutional shift toward poverty and social agendas. In the 2000s, infrastructure again became perceived as a critical component for growth and even a counter-cyclical instrument during periods of economic downturn. Specifically, water resources development (i.e. infrastructure) and management were seen to be beneficial not only for economic development but also for poverty reduction, and thereby instrumental in achieving the Bank's core mission. Broad-based water resources interventions, including dams and inter-basin transfers, were viewed as providing national, regional, and local benefits from which all people, including poor people, could gain.

The Strategy helped to re-define the water agenda as an integrated sector. In the 1980s and early 1990s, the sector was narrowly defined as delivering pipes and building hydropower plants. While the principles of integrated water resources management for sustainable water resources were already articulated in the 1993 Water Resources Policy Paper, the practice had continued to be dominated by an engineering approach

to water. Over the 1990s, it became apparent that such an approach had limitations, as expanding demands on water were exacerbating the competition among water uses, and availability of water resources was increasingly documented as a binding constraint. It became evident that water services could not be delivered without looking at the availability and quality of water resources. Supported by analytic work conducted in the 1990s, the Strategy put a marker on the sector, by defining it within a broader integrated framework that links water resources with water use (water supply and sanitation, irrigation and drainage, energy and environment).²⁷ This integrated water resources management (IWRM) framework changed the vision for the sector and provided the basis for moving away from a sector-based investment focus to a multi-sectoral approach to planning.²⁸ Coordination between development and management of water, land, and other resources took center stage in the thinking about water, on the basis that it would be a necessary condition to maximize the resultant economic and social welfare in an equitable manner without compromising the sustainability of vital ecosystems. IWRM is regarded as critical for sustainable outcomes, and increasingly viewed as offering the best available framework for building the resilience needed to adapt to climate change.

On the clients' side, the Strategy played a critical role by advocating water infrastructure investments for country development. Major outreach and consultation efforts were undertaken during the preparation of the Strategy to understand issues faced by clients, and to advocate for the centrality of infrastructure for development. This consultation effort was

FIGURE 6 SCOPE OF WATER RESOURCES SECTOR STRATEGY



Source: World Bank Water Resources Sector Strategy, 2003

not without controversy, but proved to be a useful process, triggering many discussions on water, its position in societies, and its role for development. The process motivated politicians to become increasingly interested in the principles of water resources management, and emboldened some large borrowers, especially middle-income countries, to assert leadership on the WBG Board of Executive Directors in support of the re-engagement in hydraulic infrastructure. This momentum has been maintained, leading to the WBG shareholders' endorsement of the Sustainable Infrastructure Action Plan,²⁹ the Infrastructure Recovery and Assets Relief Platform, and the Infrastructure Crisis Facility.

The Strategy aimed to re-engage the Bank in high-reward/high-risk (HRHR) hydraulic infrastructure projects. In the early 2000s, a high-level panel of Bank managers and technical experts (the “Patel Panel”) was established to assess Bank engagement in the sector. At the time, there was a sense that client countries perceived the Bank as walking away from high-risk infrastructure—even if potential rewards in terms of development could also be perceived as high—due to internal incentives, as these projects posed reputational risks for the institution. It was also believed that the comparative advantages of leadership and guidance of the Bank in these situations may not have been fully utilized. The Panel proposed a new business model geared

toward reversing this trend by promoting Bank engagement in projects with high relevance to national development strategies, including poverty reduction, where the Bank has a comparative advantage in managing the risks involved. There were two basic underlying premises for this engagement: The first was that engaging in these types of projects may involve a wide spectrum of reputational risks, but if these risks are recognized and managed appropriately, the resulting high rewards from development will accrue, because infrastructure investments are beneficial for growth. The second was that it was precisely in these difficult and controversial areas where Bank engagement could be most useful to borrowers.³⁰ With the endorsement of the Strategy by the WBG Board of Executive Directors, the Bank was given a framework to engage in large and complex new hydraulic infrastructure projects. Several Board chairs from some middle-income countries played a critical role in supporting such a re-engagement.

Those who opposed the Bank's engagement with major water infrastructure interpreted this Strategy to mean that the Bank would provide less support for water resource management.

In reality, the Strategy called for increased engagement (relative to the 1990s) in those areas of water resources management where “there is a broad consensus, Bank practices have changed for the better, and there is a need to do more of the same.”³¹ Specifically, these include groundwater management, environmental conservation, water quality, watershed management, community-based solutions, and institutional reforms. In those areas, the Strategy recommended a “principled pragmatic” approach, recognizing that water resources management is intensely political and that reform requires the articulation of prioritized, sequenced, practical, and patient interventions.

2. Bank Achievements and Lessons Learnt over FY03–09

The Strategy has contributed to the reinvigoration of the Bank's infrastructure business. The Bank is now much better equipped both to provide analytic services related to infrastructure and to respond to the many borrowers who see infrastructure as a priority area for development and growth. From an institutional perspective, the Strategy gave a solid platform for engaging across the whole spectrum of water projects, including large and complex hydropower and irrigation infrastructure projects. Infrastructure became the Bank's main business line, both for its classic growth-enhancing role and its relevance to respond to major exogenous shocks, such as the recent food crisis (for irrigation), the energy crisis (for hydropower), disasters and climate change, and the global economic and financial crisis.

The seven-year implementation period is short to enable reporting on outcomes.

On average, both on the management and development side, programs and projects, particularly the HRHR projects and water resources management reforms, have long maturation time, so that outcomes of projects will not be evident for a while. Reporting on outputs and outcomes is further complicated by the fact that the Strategy did not include a results framework, and core indicators for projects had not yet been developed. The results and lessons learnt from ninety projects with Investment Completion Reports (ICRs) are included in the analysis below.³²

2.1 Institutional Basis for an Integrated Approach

Major structural reforms helped to institutionalize an integrated approach for water resource management. In 2007, an institutional and organizational basis was established for the institution to think and deliver in a more integrated way, ensuring that Bank actions are anchored by a commitment to sustainable development. In 2007, the creation of the World Bank Sustainable Development Network (SDN), from the merger of the Environmentally and Socially Sustainable Development (ESSD) and Infrastructure (INF) networks, set the basis for strategic leadership for integrated water resource management. The ensuing creation of the SDN council responded to the need to promote specific policy objectives that required a holistic approach. Finally, the Water Resource Management Group—a thematic group that was created to support the implementation of the Strategy—was given a formal channel to promote water resource management, when it was consolidated with the Water Supply and Sanitation Sector Board, and a unified Water Sector Board was created.³³ The new Sector Board oversees all activities relating to water resources management, water supply and sanitation, irrigation and drainage, and hydropower within the institution, dissolving the earlier division of water between different units within the Bank.

To adapt and deal with the growing challenge of an integrated approach, accountability and staffing arrangements across the Bank have been reorganized.

The Water Sector Board has played a critical role in linking the Bank's operational function and its knowledge, quality assur-

ance, and strategic work. Some Regional Units were re-organized to reflect a more holistic approach to water resources. The Water Anchor Unit, which was made operational in 2007, includes the four elements of water practice (water supply and sanitation; water resources management; water quality and environment; and irrigation/water for food programs). In practice, it has proved complex. The adoption of an integrated approach has been a challenge throughout the institution: it has required a shift in mentality at all levels, a move away from staff perception of little apparent commonality of interests, and a change in incentives that favors the delivery of sector outputs over cross-sectoral outputs.

Staffing and skills have played a key role in responding to the mounting challenges of clients' needs and demands for integrated water resource management.

The Strategy was predicated on an investment in staff recruitment and training.³⁴ Over the last three years, the Bank significantly staffed up in the infrastructure sectors, with the water sector accounting for the largest number. The sector has 158 staff with professional skills ranging from general sector specialists to sector engineers. This compares to 117 staff in energy and 118 staff in transport.³⁵ A detailed skills review³⁶ of the sector shows that the number of engineers has declined markedly, while the number of general sector specialists has grown. Erosion of core skills appears to be a serious issue in the area of economics and finance, as well as specialized areas, such as water management, water use efficiency, wastewater reuse, dams, hydrology, and public-private partnerships. In addition, the Bank has very few skills to prepare and supervise projects or engage in high-level

policy dialogue with client countries on issues that have emerged as critical, such as wastewater reuse, water productivity in agriculture, use of new technologies for water management, and water quality monitoring. The Water Anchor Unit has often secured experts in those areas, on call as short-term consultants, through various technical support facilities (See Box 2).

Independent management of water resources by different water-using sectors is suboptimal because it does not take into account the water resource needs of all users and balance them in a sustainable way. Integrated Water Resources Management is regarded as critical for sustainable outcomes, and increasingly viewed as offering the best available framework for building the resilience needed to adapt to climate change.

2.2 Progress in Conceptualizing an Integrated Approach

Progress has been achieved in aligning Country Assistance Strategies (CAS) and Country Partnership Strategies (CPS) with the Sector Strategy on the principle of comprehensive water resource management. A review of 98 CAS/CPSs from 40 countries showed that “comprehensive water resource management” featured in 36 CAS/CPSs as a top priority.³⁷ Comparing the earliest CAS/CPS with the last CAS/CPS for each country, the review found that improved water resources management was the most common activity in the recent strategic documents in countries that are at the top of the water poverty index. In government-owned Poverty Reduction Strategy Papers (PRSP), more attention has been devoted to water resources management post-2003, including stakeholder participation, water quality improvement through establishment of monitoring systems, ground water management, and legal and institutional reforms.

More than 20 Country Water Resources Assistance Strategies (CWRAS) were delivered over the FY03–09 period, with the aim of producing an integrated analysis of the sector that can be used as an entry point for a dialogue with Ministries of Finance. The Strategy proposed the CWRAS as a new instrument to integrate the range of Bank programs that have an impact on, or are affected by, water resources. The objective of the CWRAS is to produce an operational plan for Bank involvement in the water sector. CWRAS involves analysis, dialogue, and decisions that pinpoint a country’s water challenges and opportunities; and set those challenges and opportunities within a framework in a long-term context, together with political, social, and economic constraints.

BOX 2 EXPERT SUPPORT TEAMS FOR WATER

Ground Water Management Advisory Team

GWMATE supports and strengthens groundwater components of World Bank projects and provides policy guidance on groundwater management and protection issues. Since 2001, GWMATE has committed about \$4.4 million for capacity development, knowledge products, and operational support in 68 projects representing \$1.9 billion in commitments. Over the last 10 years, GWMATE has captured this experience in a variety of internal and external knowledge products. To date, GWMATE has published 23 case profiles, 16 briefing notes and 1 strategic overview paper addressing a wide range of topics such as conjunctive use of surface and groundwater, groundwater and irrigation, and stakeholder participation in groundwater management.

Hydrology Expert Facility

HEF provides high level expert advice and also project-focused hydrology and water management services to support operational needs. HEF has more than 150 hydrology and water resources consultants on its roster and also a 6 member expert panel. As part of HEF’s dissemination and learning strategy, HEF prepares Technical Notes to disseminate knowledge and the state of the art in key hydrologic and water resources topics selected for their relevance to Bank operations. Support is also provided for organizing events in order to disseminate information on water resources topics of relevance to Bank staff.

Sanitation, Hygiene and Wastewater Support Service

SWAT promotes greater access to basic sanitation and hygiene. This service supports clients and World Bank staff at critical junctures in the project cycle with expertise to incorporate sanitation and hygiene promotion effectively into their projects. Since its inception in 2005, SWAT has committed about US\$ 1 million for operational support in 28 countries and 33 projects. The service has influenced a total sanitation and wastewater investment valued over US\$ 1.1 billion.

Source: World Bank

CWRAS have been used as a strategic tool to leverage Bank engagement and dialogue on water issues. Most CWRAS were produced in FY04–06; in recent years fewer have been prepared, except in Sub-Saharan Africa where some CWRAS are scheduled every year. Over two-thirds of country-specific and regional CWRAS were produced in water-poor countries. Overall, CWRAS have been effective instruments to support a dialogue with client countries on water issues in general. For example, the India and Pakistan CWRAS received extensive media coverage and laid the ground for major increases in Bank water lending. The Zambia and Mozambique CWRAS made significant contributions to improved water resources planning, highlighting the need for a river-basin approach to investments. In Ethiopia, the CWRAS helped to show the links among sectors using water and the economic impacts of hydrological variability.³⁸ This led to some realignment of the Bank’s portfolio, and the identification of investment priorities, including multipurpose hydraulic infrastructure development, water supply and sanitation, and watershed management.

By improving the understanding of the sector, CWRAS have been correlated with improved project design. While lending to the water sector has increased substantially both in countries with a CWRAS and in countries with no CWRAS, the outcome of one dollar spent on water Bank projects has been significantly better in the first group of countries than in the latter.³⁹ While CWRAS have often been developed within an overall WRM framework, they often led to sector-specific investments. Some regions, like AFR, are experimenting with ESW that will take a more integrated, sustainable approach to projects, with an explicit attempt to identify co-located sectoral investments that will

provide mutual benefits (e.g., water storage infrastructure supported by catchment management investments, both serving growing urban and industrial needs, in Kenya).

While early examples of CWRAS have been able to mobilize intra-sectoral cooperation within the Bank quite effectively, the integration between water resources management and sectors is still a work in progress. Most of the CWRAS discuss the need for water resources management and development, and most link the resource with the services to be provided by this resource. In the China CWRAS, for example, water resources management was brought for the first time, as the “missing” theme that brings the analysis together. In the Yemen, the CWRAS has been essentially an update of the national water strategy.⁴⁰ Overall, CWRAS have been successful at determining intra-sector priorities. CWRAS often outlined effective interventions but did not succeed in ensuring that the targeted interventions were realistically scheduled and funded, as evidenced by the weak link between CWRAS and CAS/CPS. Experience shows the importance of a sequential approach—a quick policy note that can feed into the CAS and Country Economic Memorandum discussions, followed by a longer assessment though CWRAS.

More recently, the World Bank Group engaged in strategic work to assess options to reduce the gap between water availability and use from all sectors. The IFC collaborated with McKinsey & Company to produce a report that identified supply-side and demand-side measures to close the water resource gap more effectively and reduce the water demand in some areas.⁴¹ Working with the WBG, McKinsey is now engaging with several countries—including Pakistan, China, Brazil, India and Ethiopia—to help develop a common fact base, to engage all stakeholders (including the often-missing private

sector) and to support government transformation programs. Over the next few months, the Bank will see if this approach can be applied in specific countries to support policy or lending programs of key strategic importance.

Strategic Environment Assessments (SEAs) have emerged as a useful instrument to mainstream environmental and social priority concerns into the water dialogue. A recent review found that SEAs have supported integrated water resources management principles across diverse uses and sectors⁴² and have covered a range of spatial scales from small catchments to large trans-boundary regions. The Nam Theun 2 Strategic Impact Assessment, together with the Cumulative Impact Assessment, looked at proposed sectoral developments within countries bordering Lao PDR. These assessments supported expanded use of irrigated approaches to river basin management and broader evaluation of potential downstream impacts. Environmental flow assessments have been another instrument to evaluate tradeoffs for ecosystem balance, a key element to integrated water resources management and necessary for environmental conservation.

Some progress has been achieved in strengthening the understanding of environmental health, as well as links between water supply and sanitation and health outcomes. The recent environment health study⁴³ confirmed the links between sanitation, hygiene, and health outcomes, by showing that diarrheal diseases play a major role in malnutrition in developing countries. In addition, several environmental degradation studies were conducted as part of the Country Environmental Analyses (CEA).⁴⁴ These various pieces are consistent with the premise of the Health Strategy that MDGs in health can be achieved through infrastructure investments.⁴⁵

2.3 Adopting an Integrated Approach to Water Projects

The Strategy suggests that independent management of water resources by different water-using sectors is suboptimal because it does not take into account the water resource needs of all users and balance them in a sustainable way. Integrated water resource management is critical for sustainable outcomes. This integrated approach can be applied at various levels—projects linking water services with water resource management, and stronger links among water-using sectors, and between water and other sectors. Since 2007, the Bank has been more actively engaged in the delivery of integrated projects, but the structure of Bank incentives still favors the delivery of sector outputs over cross-sectoral outputs. Overall, these integrated projects have been more complex and costly, and taken longer to design and implement, than traditional sector projects. Another important constraint has been that client countries are still organized by sectors; infrastructure projects are planned within sectoral boundaries, with little consideration of the implications for overall resource management.

Some advances have been made in terms of incorporating the resource dimension in traditional water services projects. Projects have begun linking the availability of water with water use more systematically. The percentage of irrigation and drainage projects approved containing water resource management components increased from 65 percent (FY97–03) to 76 percent (FY03–09). The majority of drought-related projects were irrigation projects dealing with water scarcity. Also, the percentage of hydropower projects approved containing water resource management components increased from

Integrated projects have been more complex and costly to prepare and implement than traditional sector projects. Another important constraint has been that client countries are still organized by sectors, with infrastructure projects planned within sectoral boundaries.

19 percent (pre-2003) to 33 percent (post-2003). In FY09, 50 percent of the hydro portfolio addressed river-basin planning and water use management in project planning and design, as opposed to 38 percent in FY07. In water supply and sanitation,⁴⁶ as well as in flood protection,⁴⁷ the integration of the water resource management theme declined slightly after 2003. More recently, some water supply and sanitation projects have taken a broader perspective: the Integrated Water Management in Metropolitan Sao Paulo Adaptable Program Loan, for example, is addressing water supply and sanitation, together with water resource management, pollution control, and land use in an acutely water scarce urban area.

The integration of resource management has occurred mostly among water sub-sectors and less between the water sector and other sectors. Many agricultural projects routinely include irrigation, drainage or flood mitigation, in addition to other water-related activities, such as watershed management, forestry, and drought mitigation: the China Water Conservation project focused on sustainable use and management of water resources in irrigated areas, including groundwater; it enhanced the beneficial use of water on 100,000 hectares and increased the income of 257,000 families. Flood protection projects, which used to focus on flood control and storm drains, have tended to adopt a broader integrated approach to water resource management that includes maintaining and managing the basin's land cover and managing wetlands and river channels, while appropriately planning and placing infrastructure and urban expansion. In Malawi, the Shire Valley Development project takes an integrated approach, while at the same time prioritizing and sequencing a series of co-located sustainable development investments (WSS, watershed, water resources, irrigation, and energy).

Water interventions have been increasingly integrated in projects of other sectors. The integration of water practice across Bank sectors envisioned in the Strategy is well under way.⁴⁸ While the Water Sector Board accounted for 35 percent of water lending for FY03–09, the remaining portion was divided among the Agriculture Rural Development (22 percent), Urban Development (15 percent), and Environment (11 percent) Sector Boards. Development policy lending (DPL) has also been increasingly used to mainstream water in multi-sectoral projects. DPL with water components

increased from \$114 million in FY03 to \$1.2 billion in FY09. Compared to water lending, the share of water support provided through DPLs increased from 6 percent in FY03 to 22 percent in FY09.

Water has made inroads into the environmental, social, and health agendas. More than two-thirds of completed water projects over FY01–09 followed a more general approach with integration across water and other sectors: the Mexico Structural Adjustment Loan I and Environment Development Policy Lending II mainstreamed environmental concerns into important sectors, such as water, and achieved institutional objectives related to IWRM, water law, compliance with discharge parameters, and groundwater and wastewater management; it established high-level institutional coordination mechanisms and supported the implementation of fiscal instruments for cost recovery. A review of project appraisal documents showed that irrigation and drainage, and water resources management (through water users association) projects have made some progress in integrating gender into water projects, but mainstreaming of gender in the sector as a whole is work in progress. Several examples follow to show how integration with other sectors took place.

Hygiene promotion has been increasingly incorporated in sanitation projects. This trend reflects an increasing awareness of the importance of behavioral change to complement infrastructure (latrines) investments, as the most effective way to achieve sustainable sanitation. In practice, countries have been reluctant to borrow for basic sanitation. IDA countries, for example, have prioritized basic water supply over

sanitation from limited IDA funding. Other countries have continued to finance sanitation, through government funds and external support, using traditional approaches, which have not always reached scale. For example, on-site sanitation⁴⁹ is often viewed by governments as a private household issue, as opposed to most other infrastructure services. In this context, advocacy and learning became increasingly important. Water Sanitation Program (WSP) has played an important role in piloting and testing, at scale, the most effective approaches to sanitation. With funding from the Gates Foundation, WSP has made significant investment in supporting national and local government on-the-job learning, resulting in scaling up access to sanitation for over 6 million people in 3 countries, while studying and documenting how to operationalize such successful approaches for use by all sector stakeholders.

The growth in Bank assistance for sewerage and wastewater investments was consistent with the growth in overall infrastructure, and clients' growing concerns for the environment. The Bank portfolio in sewerage increased from \$227 million in FY03 to \$1.2 billion in FY09. Much of this investment in sewerage and wastewater is undertaken to promote urban development and enhance the environment. While a recent study has shown significant health benefits from city-wide sewerage in Salvador, Brazil, sewerage can rarely be solely justified as the most cost-effective way to promote health, especially where households already have some form of alternative sanitation. It is the combination of benefits from urban development and environmental protection, combined with public health protection that usually makes the economic case for sewerage.

The Bank has reengaged in hydropower projects, integrating environmental and social risks more systematically in project design and implementation. The recent WBG Hydropower Business Plan⁵⁰ set the framework for scaling-up hydropower investments, recognizing that hydropower plays a key role in a low carbon future, as a renewable and indigenous energy source, capable of simultaneously allocating water for multiple uses. Since FY03, the WBG has approved \$3.7 billion for hydropower projects. When accounting for client contributions and co-financing, the total investment of these projects reached \$8.5 billion, providing nearly 9,700 MW through project investments. The active portfolio is well distributed among regions, with AFR and EAP accounting for 58 percent of total lending. Significant progress has been achieved in terms of implementing the triple bottom line approach, integrating environment, social, and economic dimensions in the design and implementation of hydro projects. In FY09, 27 percent of the total hydro portfolio integrated the enhancement of development benefits to local community programs into project design and implementation, compared to 19 percent in FY07. About 60 percent of active projects since 2003 included some hydrological analysis, and the share of the hydro portfolio including downstream environmental flow assessment increased from 25 percent in FY07 to 36 percent in FY09.

An important constraint for implementing an integrated approach has been the governance structure in client countries. Many middle- and low-income countries in AFR, EAP, SAR and LCR have engaged in reforming their water resources planning policies and laws, focusing on the principles of

IWRM.⁵¹ In Malawi, and Zambia, for example, the IWRM plans flow directly from the national economic development plans, and have been prepared jointly with the relevant ministries responsible for economic planning. However, implementation of these practices has proved more difficult than envisioned. Progress has been mostly achieved in terms of formulation of policies, drafting of laws and cooperation on shared resources; fewer advances have been made on cost recovery of expenses for water resources management and capacity for water demand management.⁵² Line ministries are still planning infrastructure projects, within their sectoral boundaries, with little impact on the overall resources available. Coordination among government agencies is a major challenge in client countries. And while ministries of finance could potentially be the institutional link among line ministries, they are often neither equipped, nor mandated, to ensure adequate planning of water resources.

2.4 Continued Support for Water Resource Management

Increasingly, the Bank has moved away from the simple “either infrastructure or management” stance, toward matching solutions to specific contexts and conditions. Effective water strategies now seek to combine best practices in infrastructure development with effective institution building. The Bank, client countries, and other players have adopted a more nuanced picture of development choices and conditions under which various combinations of interventions can work. Annex A describes the diversity of issues and mix of instruments that the Bank used to address water issues in seven regional and country cases.

TABLE 2 WORLD BANK GROUP ENGAGEMENT IN HYDROPOWER, FY03–FY09

Year	Project*	Country	Source
FY03	Yixing Pumped Storage Project	China	World Bank
FY04	Turkey Renewable Energy Project	Turkey	World Bank
FY05	Energy Community of South East Europe Hydropower Rehabilitation Project Nam Theun 2 Power Company Ltd	Romania Ukraine Lao PDR	World Bank World Bank MIGA
FY06	Felou Second Hydroelectric Project AES Sonel	Regional (Mauritania, Mali, and Senegal) Cameroon	World Bank IFC
FY07	Uganda Private Power Generation (Bujagali) Inga Rehabilitation	Uganda Regional (DRC)	IFC, MIGA, World Bank World Bank
FY08	La Confluencia Magat Hydro Niger Basin Water Resources Development and Sustainable Ecosystems Management Project Enerjisa Rampur Hydropower Project	Chile Philippines Regional (Niger Basin) Turkey India	IFC IFC World Bank IFC World Bank
FY09	Jiangxi Shihutang Navi & Hydropower Ambuklao-Binga Renewable Energy Development Project	China Philippines Vietnam	World Bank IFC World Bank
*Only includes projects with greater than \$75 million in Hydropower Financing.			
Source: World Bank Group			

Effective water strategies seek to combine best practices in infrastructure development with effective institution building. The Bank has moved away from the simple “either infrastructure or management” stance, toward matching solutions to specific contexts and conditions.

The growth in water development policy lending (DPL) suggests that support for water resource management has taken on a life of its own. The bulk of Bank support for water is provided through investment lending operations. Those projects have combined hard-core infrastructure with management components, through either support to planning and institutional reforms, or commitment to implement water reforms. Over FY03–09, there has been, however, a sharp increase in DPLs with water components. A review of prior actions in DPLs with water components shows that these projects helped establish important background settings to sustain water resources development and management, such as policy, strategic and legal instruments (22 percent), financing instruments (14 percent), sub-sectoral and institutional reform (13 percent), monitoring and benchmarking (13 percent), water management (11 percent) and decentralization (10 percent).

Over FY03–09, the Bank sustained its engagement in those areas for which the Strategy called for increased engagement, and learned some important lessons about the complexity of this agenda. The Strategy called for increased engagement in several WRM areas, including groundwater management, water quality, watershed management, environmental conservation, community-based solutions, and institutional reforms. It also recommended a “principled pragmatic” approach in demand management.

In groundwater management, Bank support has varied among regions, from conservation to groundwater use projects and technical assistance. Overall, Bank projects have shifted away from investments in extraction, such as construction of groundwater supply schemes or well construction for irrigation, toward groundwater conservation, in countries where there has been a rapid and large scale groundwater development in the past. The number of groundwater conservation projects hovered around 25 per year.⁵³ There are, however, some notable regional differences. In AFR, for example, water development is still very limited, and hence the potential for sustainable groundwater development and use is significant. The on-going GEF-funded groundwater project is one example of efforts to raise the awareness of policymakers to groundwater potential and management. The extent of groundwater availability and depletion is poorly understood because groundwater data are rarely collected and even less often publicly available. Many countries do not have enough information at hand to make long-term plans. In this context, the Bank has increased its support to strengthen the understanding of the issue through analytic work and provided technical assistance to client countries through GW-MATE (See Box 2).

There has been an annual increase in projects dealing with water quality management, although less attention has been given to water quality monitoring.⁵⁴ The increasing degradation of water resources from pollution and improper water resource management practices has led to situations where the safe water supply is steadily being reduced, and negative impacts on the environment have increased. The impacts on water quality (e.g. escalated incidences of vector- and waterborne diseases, malaria, dengue, and cholera as well as degraded land and water ecosystems) have become increasingly acute from intensified water pollution in rapidly growing peri-urban and urban areas, increased agricultural runoff, and poor resources management. Over a third of the lending for water quality management goes to the top ten borrowers, for which China, India, and Brazil are the top three.⁵⁵ For example, in the Philippines, the Bank supported the department of environment and natural resources to implement the Clean Water Act through the establishment of the Water Quality Management Areas.

In terms of watershed management, Bank engagement has proven complex, but effective when integrating both water and land management issues.⁵⁶ Under the right circumstances, the watershed management approach can achieve both sustainable soil and water conservation and the intensification of natural resource use that is needed to improve livelihoods. In some cases, especially in forest contexts, the achievement of both resource conservation and livelihood improvement has been challenging (e.g. the Brazil Land management project). Participation from stakeholders is not always straightforward and requires a clear direction and understanding of benefit sharing and

managing trade-offs (e.g. Brazil Parana Land management Project). The Morocco Lakhdar Project showed that successful participatory approaches require careful sequencing, inclusion, political commitments, and mechanisms to ensure sustained capacity. A multitude of additional parameters including policy and legal frameworks, engagement of public institutions, profitability and economic viability of watershed interventions, and watershed management externalities and their valuation, in addition to the environmental, social and climate change perspective, and at times veiled by the trans-boundary dimension, substantiate the complexities of engaging in these programs.

In terms of environmental conservation, Bank efforts to increase environmental sustainability around rivers and lakes, and wetlands have shown significant results. Attention to environmental flows rose from 20 projects in FY03 to 25 projects in FY07. The aims and purposes of projects have evolved over FY97–07, with 26 percent of all Bank-financed projects around rivers and lakes focusing on preventing pollution. Those projects were effective at restoring physical assets, particularly flood-damaged infrastructure. The Bank has been using payment for environmental services—a market-based approach to conservation.⁵⁷ A handful of projects to reverse the degradation of coastal areas from overexploitation were approved in the period FY03–09.⁵⁸ For example, urban-based investments in drainage systems in coastal towns in AFR have reduced flooding, and thereby protected water sources. Finally, attention to wetlands and mangrove restoration in Bank projects has increased steadily over the 2000s, possibly due to the adoption of environmental safeguard policies OP 4.00 and

OP 4.01, which stipulate the identification of potential impacts to wetlands during the environmental screening process.⁵⁹

In terms of community-driven development, the Bank has continued to promote a demand responsive approach to rural water supply. Communities have been offered a choice of water supply options, and allowed to select the one for which they are willing and able to pay. This approach can be embedded in a wide range of project designs and implementation procedures that are linked by three threads. First, the design and planning stage presents communities with several feasible options for improving their water supplies, along with a reliable estimate of the investment, operation, and maintenance costs to the community of each option. Communities have the right to select the option that they prefer, or to opt out of the project altogether. Second, communities pay part of the investment (capital) cost of the project. Third, they pay at least part of the recurrent operation and maintenance costs of the completed water schemes. Community-driven development projects have included much more social policy content and have focused more on poverty than other water projects. They use bottom-up approaches, as both the stakeholders and beneficiaries have authority over decisions, including direct responsibility to manage internal and external resources. An ESW is currently investigating the circumstances that explain when and why one management model may be preferable to another.

In terms of institutional reforms, the Bank has supported the establishment and strengthening of institutions for service delivery and water resource management agencies, with some sub-sector differences.

In water supply and sanitation, the Bank has traditionally supported utilities and municipal providers, in conjunction with investment infrastructure. In hydropower, support has focused on energy providers and less on water management agencies. In contrast, in irrigation and drainage, the Bank has balanced its support between service providers and resource management agencies, with massive support for water users associations. One way to support an integrated approach to river-basin management has been through river-basin organizations (RBOs). A critical factor that has contributed to the success of RBOs, such as establishment of the Niger Basin Authority (NBA) bringing together nine countries to promote IWRM across political boundaries, include political commitment and program of actions for cooperative development for shared resources.⁶⁰

One area of policy reform that received increased attention over the past several years is Governance and Anti-Corruption (GAC). Consistent with the Bank-wide GAC strategy, water projects address governance at the sector level by strengthening transparency, accountability, and participation across the value chain: in policy making, investment planning, project implementation, service delivery and regulation. Projects typically address these issues at the sector level by improving capacities of policy makers, regulatory bodies, service providers, and user associations to monitor project implementation and service delivery performance more effectively, and to communicate with and consult stakeholders. Good practices are emerging in the development of Governance Action Plans, Good Governance Frameworks and Risk Assessment Frameworks. For example, the Yemen Anti-Corruption Action Plan

complements the overall reform program of the water sector and builds on progress already achieved in a number of critical areas. Several instruments have been used to promote GAC efforts, including DPLs, output-based-aid and other results-based lending approaches, demand-side measures to improve accountability to citizens, as well as country governance and political economy studies. The establishment of the GAC Squad in 2009 helped to mainstream GAC in the infrastructure sectors by providing direct support to operations and advisory services and to document and disseminate emerging good practice.

The benefits of institutional reforms have often taken a long time to materialize. Water projects that include a major institutional development component entailing beneficiary participation require sufficient lead time before the physical investment activities start to allow for an adequate social mobilization process. Inter-institutional coordination is a complex process that requires substantial efforts and unwavering commitments on the part of participating entities, which are required to undergo a profound learning process and adopt significant behavioral changes. This learning process is challenging, and carrying out these commitments is both difficult and time consuming. The Strategy acknowledged the complexity of this agenda in a political economy context. Following the “principled but pragmatic approach”⁶¹ of the Strategy, the Bank sequenced its interventions, with institutional reforms often setting the stage for infrastructure investments. In practice, these reforms have often held back the completion of investment projects. Bank support for investment in physical infrastructure has been easier to

In some areas of institutional reforms, such as water pricing and water rights, the Bank has followed a “principled pragmatic approach”—principled because economic principles ensure that users take financial and resource costs into account when using water, and pragmatic 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.”

use as an entry point for a dialogue with client countries than institutional reforms (visibility and salability for politicians).

In some areas of institutional reforms, such as water pricing and water rights, the Bank has followed a “principled pragmatic approach”—principled because economic principles ensure that users take financial and resource costs into account when using water, and pragmatic 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.”⁶² Balancing effi-

ciency considerations with accountability, concerns for the poor, and the political economy of reform has been the core of the Bank's approach to water pricing. At the project level, the Bank has been pursuing the gradual coverage of costs through a series of water supply and sanitation projects, starting with operations and maintenance (O&M) costs. Issues that are addressed in these projects include how the service delivery will be met, whether the project scope could be either reduced to meet the financial capacity of the implementing utility, or whether transparent and targeted subsidies should be part of the dialogue. Efforts are ongoing to strengthen the financial analysis of these projects, including identification of subsidies and agreement with all stakeholders on how such subsidies will be funded.

The Bank and its development partners have placed an emphasis on the effective and equitable use of utility subsidies (e.g., well-targeted connection subsidies for access). Achieving full cost recovery in water supply and sanitation (WSS) has proved to be elusive even in those countries that have had the political will to embrace this goal, including high-income countries. In many parts of Asia and Africa, tariffs would have to increase between twofold and tenfold in order to have residential consumers pay the cost of the service they receive. Tariff increases of this magnitude would push about half of the households in AFR and SAR, as well as about a third of households in EAP, to reduce their consumption of those services below subsistence norms.⁶³ Such tariff increases would also have unpredictable effects on demand for utility services and nonpayment rates. Beyond those social concerns, attaining full cost recovery has also proved politically difficult, given that utility subsidies currently

benefit such a broad swath of the population—although they may often exclude the poor who are not connected to the utility network in the first place. Well-designed subsidies have been an important component of utility service pricing.

Water Public Expenditure Reviews (PERs) have been increasingly used as another instrument to engage client countries on the allocation of fiscal resources and financing of water services. In many client countries, most investments, as well as operation and maintenance costs of water services, are funded by the national budget. It is in the ministries of finance that decisions are made about the allocation of budget appropriations among different water-agency ministries, which directly affects new sectoral investment, rehabilitation, and cost recovery arrangements at the sector level. Since FY03, the Bank has produced more than 40 PERs that deal with water. Efforts have also been made to scale-up Water PERs in collaboration with Bank-administered trust funds. Water PERs have proved a useful instrument for dialogue with client countries to tackle the issue of sustainability of water utilities and tariffs (see Box 3).

2.5 Engagement in High Risk–High Reward Hydraulic Infrastructure Projects

High-risk/high-reward (HRHR) projects are those large and complex new hydraulic infrastructure projects that require major financing in both countries that have investment choices and those that are poorer. On the reward side, the Strategy posited that support for infrastructure was critical in order for growth to take off (minimum platform). On the risk side,

BOX 3 EGYPT—WATER PUBLIC EXPENDITURE REVIEW

A recent Public Expenditure Review (PER) was conducted for the water sector in Egypt, focusing on irrigation and water supply and sanitation—the two major recipients of public financing in the water sector. The PER assessed the recent trends of public expenditures, investigated different sources of fiscal stress and sources of finance, and explored the efficiency and equity implications of the various arrangements. Key findings of the Egypt PER included:

- Most investment as well as operation and maintenance costs of water services in Egypt are funded from the national budget. Cost-recovery levels still are below international comparators.
- The composition of water-related public expenditures has changed in the last two years. A higher proportion is allocated to new investments—at the expense of recurrent expenditures and debt repayments, thereby increasing the sector's long-term liabilities.
- Water service coverage is adequate in the Nile Delta area. However, it is mostly lacking in the rural/southern areas, in which water services are inequitable for low-income communities.
- Reallocating budget appropriations among different budget chapters of water agencies, among departments within agencies, and among water user groups requires a fundamental rearrangement of current budget planning and management.
- The irrigation and WSS subsectors have three options available to finance future O&M and investment costs, as identified in the Integrated Water Resources Management Action Plan.
- The WSS subsector is moving towards corporatization. It urgently needs to address the debt overhang caused by the past policy of service expansion without cost recovery.

Source: The World Bank. 2009. *Water in the Arab World: Management Perspectives and Innovations*.

BOX 4 NAM THEUN 2 HYDROPOWER PROJECT—LESSONS LEARNED

Nam Theun 2 (NT2) is a trans-basin hydropower and development project in Lao PDR that continues to generate valuable lessons for the country and for the hydropower industry. The policies, institutions, systems and practices that have emerged should shape the way future hydropower projects are sustainably developed.

- **Preparation:** Investing in communications and building a working consensus across all stakeholders creates an enabling environment for project approval, as well as making implementation easier.
- **Finance:** The WBG can play a key catalytic role—a US\$20m grant and up to \$250m in guarantees—helped leverage an overall financing package of around \$1.4billion. While other IFIs also contributed, the majority of project finance was private.
- **Adaptive management:** Strong legal agreements and good planning is critical, but effective implementation requires ongoing adaptive management—the need for stable objectives should not be allowed to discourage flexibility in how issues are addressed.
- **Resettlement:** NT2 shows that a well managed and resourced resettlement process can leave the vast majority of resettled people better off in the short-term; translating this temporary gain into longer-term and sustainable livelihoods requires a multi-year effort by all parties.

Based on ongoing implementation and strong data collection efforts, many more lessons are likely to emerge prior to the end of the Bank’s engagement in 2017. Given the global debate about hydropower and climate change, one area to watch is results from a long-term Électricité de France and Nam Theun Power Company effort to accurately measure Greenhouse Gas emissions from the NT2 reservoir.

Source: World Bank, Update on the Lao PDR: Nam Theun 2 (NT2) Hydroelectric Project, 2009 and Bank Staff.

the Strategy recognized that these types of projects could cause major reputational risks for the Bank that would have to be mitigated. The understanding of what constitutes a HRHR infrastructure project evolved over time. The definition of what constitutes a “high risk” project varies, from category A (risk for the environment) to projects that trigger safeguard policies.⁶⁴ Similarly, the definition of what constitutes a “high reward”⁶⁵ project varies from large infrastructure projects to those that are innovative.

The World Bank Group delivered high risks/high-reward projects, beyond Bujagali (Uganda) and Nam Theun 2 (Lao PDR). The Strategy committed to deliver one corporate HRHR project per year, with the vision that those projects would engage senior management from early stages of preparation through implementation to ensure an engagement at the corporate level on whether the Bank should be involved and how risks would be managed. While Bujagali in Uganda and Nam Theun in Lao PDR projects are typically regarded as HRHR projects, other projects meet the HRHR criteria. For example, the Ethiopia Irrigation and Drainage project helped to support the irrigation of 20,000 ha and contributed to ascertain irrigation potential of 80,000 ha; but the project triggered 7 safeguards, and an estimated 9 reward factors. The Urban Flood Prevention project in Argentina supported 15 km of tunnels in urban environment, affecting directly 1.5 million and indirectly 3.5 million of people. As another example, the Rampur Hydropower project in India is a self-classified high-risk run-of-river development in a highly seismic region with substantial potential gains for renewable power development, whose risk of non-engagement was considered higher.

While the Bank was often perceived as the partner of choice to prepare and implement these complex projects, they often entailed significant reputational risks that had to be managed. By their sheer technical complexity, and multi-sectoral impact, water projects have been subject to a large number of inspection panel cases. Some have even argued that the Strategy was conducive to promoting a risk-taking approach to water infrastructure, thereby contributing to increases in the number of inspection panel cases against Bank projects. While it is true that the Bank has learnt lessons from its experience in high-profile complex hydraulic infrastructure projects, it has also made major advances in integrating multiple dimensions into its projects, beyond the technical design, with long-term benefits far outweighing short-term costs (e.g. in terms of increased access to energy, food production, number of beneficiaries and flood protection).

The Bank is adopting a vision of sustainability that goes beyond ensuring compliance to safeguards. The Bank took center stage in the preparation of these high-profile and complex projects, and it has been subject to some sharp criticisms from some NGOs and stakeholders. The Bank has responded over time by developing an extensive set of processes and Operational Policies to ensure that these risks are appropriately addressed and mitigated in project design and implementation. As a result, the Bank has a much longer and more complex list of Operational Policies than any other development bank to consider when designing and implementing these projects. It is now clear that the Strategy may not have put enough emphasis on the complexity with which social and environmental dimensions could be factored into the design and implementation of projects. Those projects require

long-term engagement of the Bank that goes beyond the traditional timeframe for projects. Many lessons have been learnt from these experiences (see Box 4). By their complexity, these projects have pushed the Bank's thinking beyond ensuring compliance to safeguards: sustainability is thereby integrated into both water resource management and development projects not because of a requirement but because there are good principled social and environmental reasons to do so.

2.6 Knowledge to Support the Dialogue on Water

The Bank has been supporting client countries efforts to obtain better information for decision-making. One reason that policymakers have found it so difficult to curb the overexploitation of land and water and their related ecosystems is that neither the managers nor the users of the resources have accurate and timely information. They do not know how much of the resource is present, how much is being used, or how their actions will affect quantities in the future. Bank projects have helped countries to establish systems to collect, analyze, and use hydrological and meteorological data. Over half of the projects that used monitoring data for disaster prevention and mitigation succeeded in getting the information in the hands of people whose job involved mitigating natural disasters and reducing damages. Improved and innovate use of technologies, such as remote sensing, has improved the availability and dissemination of information. The Bank is working on comprehensive monitoring systems combining the latest remote sensing data with models and ground based monitoring data in projects.

While impact evaluations (IEs) may yield useful information on the impact of water investments, clients have been reluctant

to include them in projects, placing more emphasis on borrowing to meet access needs. From none in FY03, the Bank completed 13 IEs in FY09 focusing on hand-washing and sanitation, mostly in LCR and AFR. The sector is also actively engaged into the World Bank's Development Impact Evaluation initiative, with a large group of studies looking into health impacts of water and wastewater interventions, and to a lesser extent into income/productivity impacts of these interventions. For example, WSP is working on a state of the art, large scale impact evaluation project to document the wide range of health, development, social, and economic outcomes of a global project to scale up rural sanitation in India, Indonesia, and Tanzania. In addition to collecting a broad range of indicators to allow an intensive study of sanitation's economic, developmental and social welfare impacts, the intervention costs and the value of these diverse benefits will be closely examined. The study will provide insight on how best to position IEs in the water sector going forward.

As part of the Bank's broader efforts to strengthen results-based decision-making, water has been among the four sectors that have spearheaded the effort to define Core Sector Indicators for projects. Core indicators are being implemented for IDA projects in water supply, and are being developed for sanitation, as well as irrigation and drainage.⁶⁶ Efforts are ongoing through the preparation of the new environment and energy strategies to develop core indicators that are relevant for the water sector as well (e.g. water quality, coastal zone management, and groundwater). Several other initiatives are underway to support more systematic efforts to strengthen data collection for decision making. For example, in the 1990s, the Bank started a major initiative to standardize utility performance

BOX 5 OUTCOMES OF BANK-FINANCED WATER SUPPLY AND SANITATION PROJECTS

- Access to safe water in IDA countries improved from 65 percent in 1990 to 78 percent in 2006.
- IDA directly contributed to shrinking the water and sanitation access gap by at least 25 million people (22 million for water) in 2000–06.
- Half the projects in IDA's water and sanitation portfolio measured quantitative outcomes—its contribution to closing the access gap is certainly much higher.
- As a result of the increased focus on results measurement, 67 percent of water supply and sanitation projects now have baseline outcome indicators, compared to 32 percent in FY05, despite the fact that constructing baselines in dysfunctional utilities or rural locations where data availability is scarce can be challenging.
- Bank-financed water supply and sanitation projects in IBRD and blend countries, which closed between 2000 and 2008, financed access to water for more than 20 million people, sanitation to close to 10 million, and have upgraded service to at least another 6 million.
- Examples of outcomes at the project level are provided in Annex D.

Source: IDA At Work; IBRD Results, World Bank 2010.

indicators, which was followed by a major data collection effort, resulting in current database that tracks the performance of 2,500 water and wastewater service providers from 110 countries around the world (International Benchmarking Network).

Economic and sector work has played a critical role in laying the foundation for future lending. The sector adopted a strategic approach to ESW, with a few flagship products⁶⁷ and the bulk supporting country-level engagement and dialogue. It has been estimated that, following the delivery of a

major piece of Water ESW, the Bank approved water-related lending in nearly 70 percent of instances. Thus, countries that benefited from Water ESW had a 40 percent higher probability of a new lending operation in the year that followed. For example, major pieces of Water ESW in Niger FY06 and FY08 helped lay the foundation for two new water operations in FY07 and FY09.⁶⁸ Similarly, the Pakistan's CWRAS culminated in an Irrigation DPL for Punjab (the Bank's first irrigation DPL). As a result of such support, there is evidence that the Government of Punjab adopted good policies on intra-province water allocations,

improved asset management, increased attention to rehabilitation of critical infrastructure (e.g. barrages), reduced the gap between O&M expenditures and receipts from water charges by turning over responsibility to water user associations, and improved measures to better manage groundwater. The Ethiopia CWRAS led to a major reallocation and increase in public funding for water. Through its engagement in large infrastructure projects, the Bank gained knowledge and experience in dealing with reputational risks which compromised project development in the 1990s, including engineering, environmental flows, biodiversity protection, resettlement, social inclusion, optimization, and sharing of the benefits of water resource among all stakeholders.

The leverage of Bank assistance by global programs and partnerships has been significant. It is estimated that the second phase of Bank-Netherlands Water Partnership and BNWPP was linked to more than \$13 billion in Bank lending (while total disbursements of these two trust funds amounted to less than \$19 million). WSP's growth in operations has followed the Bank's lending trends in WSP-focus countries, often laying the foundation for larger Bank investments. For example, WSP's technical support for operating in slums and peri-urban settlements helped initiate a \$150 million World Bank water and sanitation project in three districts of Kenya. In Zambia, WSP was involved in the project design and implementation support for the \$33 million water sector performance improvement performance project.

Cooperation with Other Multilateral Development Banks was expanded under the Infrastructure and Recovery Assets Platform. The Infrastructure Recovery and Assets platform (INFRA),

which encompasses water, supports counter-cyclical spending on infrastructure in the aftermath of the crisis and raise awareness on the need to continue financing infrastructure to provide the foundation for rapid recovery and job creation and to promote long term growth. One of the primary objectives of INFRA has been to improve the effectiveness of harmonization amongst development partners on crisis response. Toward this end, an INFRA Partners Forum took place on July 9-10 in Brussels co-hosted with the European Commission and attended by the core MDBs and IFIs. The Forum discussed ways to improve cooperation and to leverage the resources of INFRA partners in support of critical infrastructure initiatives in developing countries hard hit by the global economic downturn. Partnership arrangements range from co-financing or parallel financing to joint project development and/or coordination on technical assistance support. One example of cooperation among MDBs is the Agricultural Water for Africa (AgWA) initiative, for which the African Development Bank and the World Bank are closely cooperating. This initiative will foster the implementation of the agricultural water strategy: Investment in agricultural water for poverty reduction and economic growth in sub-Saharan Africa which was jointly prepared by the World Bank, AfDB, Food and Agriculture Organization, International Fund for Agricultural Development, and International Water Management Institute, in response to the New Partnership for African Development's desire to implement Pillar I (land and water management) of the Comprehensive Africa Agriculture Development Program (CAADP). The CAADP encompasses among other objectives an increase in the area under sustain-

able water management in Africa to 20 million hectares; up from less than 7 million hectares at present.

2.7 Complex Trans-boundary Water Issues

As water transcends political boundaries, it becomes a regional public good for which collective action can secure sustainable win-win benefits. Some 40 percent of the world's population lives in basins shared by two or more countries, and there are more than 300 rivers and lakes and numerous underground aquifers shared by two or more countries. AFR has more than 80 international rivers and lake basins, among which the largest include the Congo, the Nile, the Zambezi, the Senegal, the Niger, the Volta, the Gambia, Lake Victoria, and Lake Chad. Some of these major river and lake basins are shared by as many as ten or more countries. Nine countries share the Congo and Niger, ten share the Nile, and eight share the Zambezi and Lake Chad. Unilateral development of water resources by a single country is suboptimal, and collective action for the sustainable management of water resources is necessary not only to mitigate water-related risks (e.g. floods and droughts) to the population, but also to maximize development opportunities and reduce the risk of conflicts. Inadequate attention to trans-boundary management of water resources can exacerbate the livelihoods, undermine growth, and underpin many resource-based conflicts.

As an international financial institution, the Bank has a major role to play in facilitating cooperation on international waters. The Bank has acted at the strategic level to facilitate a political commitment to long-term cooperation, and at the programmatic level

As water transcends political boundaries, it becomes a regional public good for which collective action can secure sustainable win-win benefits. Inadequate attention to trans-boundary management of water resources can exacerbate the livelihoods, undermine growth, and underpin many resource-based conflicts.

to support planning and investment in river basin management. The Bank has used a mix of instruments, including institutional capacity building for river-basin management, using the river basin rather than the state as the planning unit, large infrastructure investments programs in hydropower and agriculture with long-term benefits, and environment and local development activities with short-term benefits.

The Bank has supported cooperation among riparian states, often in multi-project programs. The Bank delivered more than 300 projects dealing with water resource management linked to rivers, lakes, and coastal systems over the FY97-07 period. During that period, 27 Bank-funded projects with activities related to international waterways were closed, while 96 are still ongoing,

pointing to the increasing importance of trans-boundary projects in recent years. Almost 70 percent of the lending for trans-boundary projects were to AFR and ECA. For example, the Bank has made progress in supporting the Nile Basin Initiative, a regional program led by the countries, establish capacity for water-related management, and continues to make progress in the delivery of its investment programs (e.g., the Eastern Nile First Joint Multipurpose Program, the Equatorial Lakes Power Program, Tana Beles Integrated Water Resources project in Ethiopia). In most lake/river basin projects, institutional capacity building has been a core component of Bank assistance. The Bank has supported a diversity of institutions, from those with resource allocation responsibilities, to coordinating institutions, to advisory institutions. Institutional responsibilities may encompass resource development, service delivery, regulatory, or coordinating roles. Informal institutions, such as traditional village committees or NGOs can also play an important role.⁶⁹

From the perspective of the Bank and other multilateral organizations, engagement with riparian states on international rivers is difficult and risky. The Bank can only assist its borrowers to address trans-boundary issues where there is a country willingness to negotiate. Stark divergence of national interests, a weak regional institutional and regulatory framework for water, or political instability, can represent major constraints and prevent the resolution of disputes within a trans-boundary river basin. Long-term sustained efforts that go beyond the time-horizon of traditional Bank projects are required for engagement in those issues. (See Box 7) Understanding the political

economy dimensions of trans-boundary engagement through upstream analytical work, and technical assistance are critical in reducing the risk profile of the investment projects. Coordination of support from development partners to ensure harmonization of their assistance takes time and resources from all involved parties, but is essential for effective results.

2.8 Partnering with the Private Sector

World Bank Group initiatives to encourage increased private sector involvement in the operation of urban and rural water supply and sanitation had generally positive impacts.⁷⁰ Public-private partnership (PPP) projects focusing on urban water supply and sanitation generally resulted in increased supply, production, and quality of water as well as improved fee collection, tariff increases, and installed water meters.⁷¹ Successful PPPs for urban water utilities which had received extensive support from the Bank, both in design and financing, include affermages, management contracts, and mixed ownership companies, and concessions. Projects with private sector involvement in rural water supply and sanitation generally featured high outcome ratings, but represent a very small share of PPP water projects. The role of the domestic private sector in the provision of basic water supply and sanitation will increasingly be examined as a complement to the large-scale traditional PPPs. More recent projects have featured stronger emphasis on integrated water resources management, featuring greater cross-sectoral integration and supporting institutional frameworks featuring the river basin as their unit of analysis. For example, Malawi's Second National Water Development Project developed an invest-

BOX 6 SENEGAL RIVER BASIN MODEL—BENEFIT-SHARING IN INTERNATIONAL RIVERS

To address many of the challenges experienced over the last several decades, a new Water Charter was signed in 2002 to fully realize the potential to share the benefits of development with the broader population in the Senegal River Basin. After almost 30 years of activities in the Senegal River Basin, some important lessons have emerged on benefit-sharing:

- The experience of Senegal stands out compared to other river basins around the world on the adoption of the principles and practices of benefit sharing. The commitment to this principle was codified through the establishment of legal conventions and a remarkable degree of supra-national executive authority vested in the Organization pour la Mise en Valeur du Fleuve Senegal (OVS).
- Benefit-sharing is not only about how nations share the benefits of a common resource, but also about how those benefits and costs of development are shared with the population at large. Some segments of the population have benefited (e.g. urban), while other have not (e.g. traditional recessional farmers).
- The Senegal experience highlights an important dilemma: the frequent disconnect between national and local development. For example, the objective of achieving food security in hindsight was dependent on not only infrastructure but also on national policies (e.g. stagnant agricultural extension, decrease in the provision of rural services, country-wide structural adjustment). Thus, to ensure that these benefits would be shared broadly required that regional institutions be well coordinated with the activities, and perhaps more important, policies of member states.
- For the concept of benefit sharing to be fully realized, institutions need to be adaptable and have legal frameworks to allow for flexibility.

Source: Benefit Sharing in International Rivers: Findings from the Senegal River Basin, the Columbia River Basin, and the Lesotho Highlands Water Project, W. Yu, World Bank, 2008.

ment strategy that integrates the development needs for water resources by different sectors. IFC's investments have supported traditional models (BOTs, BOOTs, leases, concessions), but there has been increasing focus on PPPs as the financial model most appropriate to bring private investment into the sector. IFC's involvement in PPP projects comprised both financing support to projects and advisory interventions. For example, IFC has invested in Manila Water in the Philippines, Epure and Asia Environment in China, Metito in MNA, and the Sociedad de Acueducto, Alcantarillado y Aseo de Barranquilla, among others. Those projects have generally resulted in operational improvements in service delivery and financial sustainability including reduction in non-revenue water and increase in service coverage.

PPPs in water utilities have resulted in substantial capital investment from the private sector in some successful cases, but have generally yielded fewer capital flows than originally intended. However, they have yielded other important benefits. In the 1990s, an important rationale for implementing PPPs was attracting private funds to the water sector. But, given high country and sector risk, private investment for water PPP projects declined significantly, and private financing became scarce and expensive. The most consistent contribution of PPPs has been in improving service quality and operational efficiency of water utilities.⁷² In this sense, PPPs can have a significant indirect financial impact by improving the overall creditworthiness of the sector. This point is well illustrated by the success of affermage schemes in Western and Central Africa.⁷³ Such PPPs were part of well-designed sector reforms with clear policies and strict adherence of governments to their policy commitments.

Unbundling the key functions of policy formulation, regulation, financing, asset ownership, and service provision, while establishing contractual relations between public and private partners, has enhanced the sector's accountability framework. Regarding tariffs, most poorly performing public utilities in developing countries have water tariffs that are well below full cost recovery levels, and raising them is often a necessary component of reform towards financial sustainability. In practice, the evidence from the literature on the impact of PPPs on tariffs is largely inconclusive.

Output-based aid (OBA) has been used to support PPP transactions and promote access to basic water services to low-income populations. There are currently 31 OBA projects in water supply and sanitation⁷⁴ with Bank participation (equivalent to \$179 million), mostly to support PPP in water supply schemes, with half of those projects in AFR and a quarter in LCR. OBA ties the disbursement of public funding in the form of subsidies to the achievement of clearly specified results that directly support improved access to basic services. Several lessons emerged from the implementation of these schemes: While OBA leverages private funding, funding from private sector is limited because of its pro-poor focus. OBA payments have led to improvements in operational efficiency and the delivery of innovative solutions to serve the poor. Furthermore, OBA has demonstrated efficiency gains through competition in most sectors when competitive pressures have been applied in the selection of the OBA service providers. In many of these schemes, the market is the one determining the level of appropriate subsidies. OBA is currently being scaled up through a program approach with several important client countries (e.g. Mexico and Morocco), and is also

BOX 7 OUTPUT BASED AID—RESULTS IN WATER SUPPLY AND SANITATION

A number of lessons can be learned from recent OBA projects. Some notable results which emphasize targeting beneficiaries, managing performance/limiting risk, and monitoring results are provided below:

Targeting

Almost all OBA water projects use geographic targeting as the primary mechanism, and a number of use self selection and/or means tested targeting to increase their targeting effectiveness. India's Improved Rural Community Water Project in Andhra Pradesh successfully combines the three major targeting mechanisms. To target individual beneficiaries in the villages, the project uses the government's white ration card—a system that entitles low-income individuals to obtain basic commodities (e.g., rice, flour) at a reduced price. These households can purchase water in jerry cans from community water distribution points. As of March 2009, water treatment plants have been installed and independently verified in 16 villages serving over 7,200 households that are below the poverty line.

Performance/Risk

In most projects funded by GPOBA, a portion of the output based payment is withheld until several months of service delivery to enhance the sustainability of the scheme. In Vietnam's Rural Water project, 80% of the subsidy is disbursed upon realization of the connection and the remaining 20% after proof of six months of satisfactory service provision. By February 2009, ten water schemes were operational with 2,726 verified household connections.

Monitoring

The Morocco Urban Water and Sanitation project provides a good example of a more elaborate monitoring and verification system for an OBA scheme. There are two levels of monitoring for this OBA scheme: 1) a quarterly monitoring report provided by each operator with information on number of connections made, total number of beneficiary households, uptake ratio of beneficiary households, etc.; and 2) an annual report with information on average residential tariff for beneficiary households, project unit costs of house connection operator and targeted area as per actual incurred expenditure and discrepancies with estimated project costs. As of April 2009, a total of 2,895 water connections and 2,846 sewerage connections have been verified as delivered to pre-specification.

Source: Global Partnership for Output Based Aid. Output Based Aid: A Compilation of Lessons Learned and Best Practice Guidance, 2009.

being implemented as part of a new Bank-funded affermage PPP in Cameroon.

The high risk profile of the water sector, in terms of political, tariff, currency, regulatory, and counterpart risk has resulted in caution on the part of long-term lenders and private investors for larger projects, particularly in large scale concessions. As a result, IFC has tended to finance water and sanitation investments focusing on extending reach and access, and to a limited extent on supporting technologies in the sector. IFC has followed similar objectives in financing investments in the hydropower and agriculture sectors. At the end of FY09, projects in municipal water supply and sanitation served a total of 20 million water customers. IFC's water investments have increasingly supported local/regional emerging market players in the sector who are taking on a larger share of the private water market.

Although guarantees can be used to mitigate the risks of the private investors and financiers, they have been called only for large strategic projects. Out of the 124 guarantees issued since 2001 by international financial institutions, only four guarantees were issued for WSS projects, representing less than one percent of all guarantees issued, or 1.5 percent of the value of all infrastructure guarantees. Risk instruments can also improve private finance options for medium to more attractive projects in villages and small towns. However, projects that fall into the areas that show low potential for private financing and that are not viable are likely to need considerable public sector investment and intervention before they can qualify for the application of risk instruments. Guarantees cannot force certain groups of investors and financiers to alter their business models. However, for large

strategic projects, such as Bujagali and Nam Theun 2, guarantees typically bridge a gap in market perception and have been crucial to catalyze private sector involvement. Such strategic use is likely to continue. Also, guarantees cannot or should not make fundamentally unviable projects viable. IFIs offer a wide range of risk mitigation instruments designed to address the need for noncommercial, political risk mitigation products by lenders and debt or equity investors contemplating investment in emerging markets. Innovative use of guarantees, such as Partial Risk Guarantee type structure to backstop government action or inaction, or specific regulatory risks, might further increase their usefulness, especially when coupled with a need to leverage further IFIs resources.

Around \$2.4 billion of foreign investment was facilitated in the water and hydropower sector during FY03–09 though MIGA investment guarantees. From FY03–09, MIGA supported 20 water and hydropower projects with total gross exposure of \$597.1 million. Over this period, China had the largest portfolio with 9 water projects totaling \$234.2 million, accounting for 39.2% of MIGA's total water and hydropower portfolio. MIGA has provided guarantees in Russia, Uruguay, El Salvador, Egypt, Jordan, Senegal, and Lao PDR. MIGA has also been instrumental in resolving investment disputes between foreign investors and local partners/local government in water projects. For example, MIGA worked together with the Chinese government to successfully resolve an investment dispute between a private foreign investor and its local partner/local government for a water project in Zhejiang Province. The project is now operating as originally envisioned, and the foreign investor and its local partner/local government have established a good relationship.

Endnotes

27 Separate strategic documents handle the sector-specifics, including *Water Supply and Sanitation Sector Business Strategy: FY2003–07*, September 2003; Sector Strategy Implementation Update FY05 (CODE2005–0100, November 8, 2005); *Reaching the Rural Poor: An Updated Strategy for Rural Development* (R2002–0043, August 2002) and *World Bank Group Agriculture Action Plan; Environment Strategy—Concept Note* (CODE2009–0036); and *World Bank Urban and Local Government Development Strategy* (2009).

28 The graphic depiction of IWRM is figure 13 in the Strategy (the “comb” refers to WRM and the “teeth” to the water-using sectors. The vision of the Strategy is one of “pragmatic but principled approach” to IWRM.

29 *World Bank, Sustainable Infrastructure Action Plan, FY09–11* (CODE2008–0028), March 21, 2008.

30 The Concept Note of the Strategy included the Bank's formal response to the “Report of the World Commission on Dams” (CODE2001–0096)

31 See, *Water Resources Sector Strategy*, 2003, page 2.

32 For the majority of projects that involved unsatisfactory IEG ratings, water was usually a small component, and it could not be concluded from the ICRs that the outcome rating was necessarily directly related to the water component.

33 The Water Sector Board consists of the 6 regional managers, WSP, HR, DEC, IFC, MIGA, WBI, IEG, and a representative of the Agriculture Rural Sector Board. The Agriculture and Rural Sector Board includes a representative from the Water Sector Board.

34 *Water Resources Management Staff—Human Resources Report*, Water Resources Management Group, 2001 (internal)

35 This includes 95 internationally recruited staff, 48 locally recruited staff, and 49 ETCs staff.

36 *Energy, Transport and Water Sectors: A Review of Skill Gaps*, Human Resources Networks Team, 2008 (internal).

37 *Coverage of Water Issues in Country Assistance Strategy* (background document), IEG, 2009.

38 *Managing Water Resources to Maximize Sustainable Growth: A World Bank Water Resources Assistance Strategy for Ethiopia*, Water P-Notes 13, June 2008.

39 Based on a statistical analysis of the proportion of satisfactory outcomes (using IEG outcome indicator) for projects (weighted by dollars disbursed) in countries that have a CWRAS compared to the proportion of satisfactory outcome for projects in countries that do not have a CWRAS.

40 *Republic of Yemen Country Water Resources Assistance Strategy*, Water P-Notes 8, June 2008.

41 *Charting our Water Future: Economic Frameworks to Inform Decision Making*, 2009.

42 *Strategic Environmental Assessment: Improving Water Resources Governance and Decision Making: Case Studies*. World Bank, 2009. Also, *Strategic Environmental Assessment in East and South East Asia, A Progress Review and Comparison of Country Systems and Cases*, World Bank Discussion Paper (Draft), 2009.

43 *Environmental Health and Child Survival. Epidemiology, Economics, and Experience*, World Bank, 2009.

44 *Republic of Colombia: Mitigating Environmental Degradation to Foster Growth and Reduce Inequality*, World Bank, 2006; *Republic of Peru Environmental Sustainability: A Key to Poverty Reduction in Peru—Country Environmental Analysis*, World Bank, 2007.

45 *The World Bank Strategy for Health, Nutrition, & Population Results*, 2007.

46 On average, the percentage of WSS projects approved containing the water resource management theme decreased from 38 percent (pre–2003) to 33 percent (post–2003), with an annual increase post–2003.

47 The percentage of flood protection projects approved containing the water resource management theme decreased from 80 percent (pre–2003) to 61 percent (post–2003).

48 *Water and Development: An Evaluation of World Bank Support, 1997–2007*, CODE2009–0106, December 2009.

49 *Financing on-site sanitation for the poor—A Six Country Comparative Review and Analysis*, Tremolet Sophie, Peter Kolsky and Eddy Perez, WSP and World Bank, 2010.

50 *The World Bank Group's Hydropower Business Plan: Scaling up for Development*, 2009.

51 At the World Water Forum in Mexico (2006), it was reported that out of 95 countries surveyed, 74 percent either had IWRM plans/strategies in place, or had initiated a process for formulation for such plans/strategies.

52 See UNEP-DHI collaborating Centre on Water and Environment

53 Ibid. IEG.

54 Ibid. IEG.

55 Ibid. IEG.

56 *Rural Watershed Management—The Power of Integration*, Water P-Note 28, 2009.

57 For example, in Colombia, many water user groups pay for watershed services; Costa Rica developed indices for biodiversity conservation and carbon sequestration services that different land uses provide.

58 Croatia Coastal Cities Pollution Control and Romania Pollution Control; and Sustainable Tourism Development in Montenegro.

59 *Water and Development: An Evaluation of World Bank Support, 1997–2007*(CODE2009–0106, December 2009).

60 *The Niger River Basin: A Vision for Sustainable Management*, Water P-Notes 16, October 2008.

61 See *Water Resources Sector Strategy, 2003*, page 3.

62 See *Water Resources Sector Strategy, 2003*, Page 22.

63 *Water, Electricity, and the Poor. Who Benefits from Utility Subsidies?*, K. Komives, V. Foster, J. Halpern, and Q. Wodon, World Bank, 2005.

64 The Bank has 10 environment, social and legal safeguard policies. OP 4.01 is the umbrella policy for other safeguard policies (OP 4.12 on involuntary resettlement, OP 4.37 on safety of dams, OP 7.50 on international waterways, OP 4.11 on physical cultural resources, OP 4.04 on natural habitats, OP 4.10 on Indigenous Peoples, OP 4.09 on pest management, OP 4.36 on forests, and OP 7.60 on disputed areas).

65 Contrary to risk factors (related to safeguards), there are no established “reward” factors. For the purpose of this analysis, factors such as the economic rate of return, number of beneficiaries, high water commitments, and high commitment of new infrastructure were used. Also, to account for compliance with the Strategy principles, a set of 12 parameters was also used (related to the CAS, water resources management, water quality management, sector reforms, public private partnerships, NGO participation, Cost recovery, financial analysis, poverty related, stakeholder participation, gender, and M&E).

66 Core indicators: water supply (Improved community water points constructed or rehabilitated (number), new piped household water connections (number), piped household water connections affected by rehabilitation works undertaken (number), number of water utilities supported (number), number of other water service providers supported (number)); Sanitation (Number of people trained to improve hygiene behavior or sanitation practices, number of new sewer connections constructed, number of improved latrines constructed; and irrigation and drainage (Area provided with irrigation and drainage services, number of water users provided with irrigation and drainage service, Number of operational water user associations).

67 *Health Impacts from Water Supply and Sanitation in the Middle East and North Africa*, 2005; *Agricultural Water Issues and Approaches*, 2005; *Making the Most of Scarcity: Accountability for Better water Management Results in the Middle East and North Africa*, 2009; *Water and Climate Adaptation*, 2008; *Roadmap for Urban Water Sector Reforms*, 2009.

68 The Agro-Sylvo-Pastoral Exports and Markets Development Project, approved in FY09, is the single largest water project approved in Niger from FY03-FY09, with nearly 25 percent of the \$40 million project allocated to water and irrigation sectors. The project appraisal document makes extensive references to the FY08 Irrigation Sector Review, which presented an overview of major constraints that hinder the full expression of the irrigation potential in Niger and provided strategic orientation for sustainable irrigation development in the future.

69 *Lessons from Managing Lake Basins—Measuring Good Governance*, Water P-Notes 25, 2009.

70 Apart from the focus on water supply and sanitation services, relatively recent reforms supported by the Bank include the establishment and/or strengthening of user associations, public-private partnership in irrigation, and new legal and regulatory institutional frameworks to encourage private sector participation.

71 *The World Bank's Experience with Private Sector Involvement in the WSS Sector*, IEG, 2007.

72 *Public-Private Partnerships for Urban Water Utilities*, World Bank, 2009.

73 *Public-Private partnerships to Reform Urban Water Utilities in Western and Central Africa*, P-Note 38, June 2009.

74 Seven of the projects involve OBA subsidies funded by IDA and IBRD, for a total OBA subsidy funding for the water sector of US\$105.6 million. Twenty-one projects include GPOBA subsidy funding for a total of US\$63.3 million.



Part 3

World Bank Group Strategic Directions for the Sector, FY10–13

Part III shows that the Strategy adopted in 2003 is still very much at the core of the Bank's future work and defines what changes are needed to respond effectively to the complexities of the rapidly changing environment. The recommendations of the recent IEG evaluation on water projects can be accommodated within the framework of the existing Strategy. IEG called for the Bank to: (a) help clients and partners to ensure that critical water issues are adequately addressed; (b) strengthen the supply and use of data in water to better understand the links between water, economic development, and project achievement; and (c) monitor demand management approaches to identify which components are working and which are not, and build on these lessons.

1. Validity of the Water Resources Sector Strategy

The current Water Resource Sector Strategy remains sound and relevant to address client needs. The issues that were identified by the Strategy (resource, access, capacity, use and environment) are still those that should be addressed today. As a result, the objective of the Strategy—to assist client countries to improve water resources management and development for sustainable growth and poverty reduction—remains relevant to client needs. The Strategy was forward-looking, especially on topics such as population growth, urbanization, and climate change. But the external environment is rapidly evolving. Three issues have gained more prominence in the international arena since 2003: (i) the role of water for adaptation and mitigation for climate change post-Copenhagen; (ii) the centrality of agricultural water management for food security in the aftermath of the global food crisis; and (iii) the risk of not meeting the water-related Millennium Development Goals by 2015.

Climate change was discussed in the Strategy, five years before the Bank would develop its Strategic Framework on Development and Climate Change. The Strategy recognized the relevance of climate change for the sector and the complexity of managing water resources when predictable and regular flows are low, and patterns of precipitation highly variable, under a changing climate. Since then, the understanding of the impact of climate change has improved: there is now scientific evidence that the dynamics of the hydrological cycle is intensifying and accelerating due to climate change, with notable effects on water (although not quantified). It is now acknowledged that climate change cannot be considered solely

as an environmental problem but is also a development issue, with the water sector driving part of the solution for adaptation and mitigation to climate change.

While unforeseen, the sharp increase in food price in 2008 showed the continued importance of agriculture investment and water as a key input to increase productivity and ensure food security. The Strategy noted that increased world food security has been one of the great development achievements of the last 40 years, in part due to the contribution of irrigated agriculture. However, a changing global context, with global food prices more than doubling from 2006 to mid-2008, and more than 100 million more people moving into poverty, added new urgency to improvements in agricultural water management.⁷⁵ The surge in food prices was the result of a number of demand and supply factors that converged in 2008. Strong rises in per capita income in emerging economies raised the demand for food, especially meat and the related animal feeds. The demand increase was amplified by low global grains stocks and thin markets. At the same time, supplies stagnated due to weather disruptions and rising energy and fertilizer costs. Despite declines from the peak prices of mid-2008, food prices in the medium term are projected to remain higher than in the past, and likely to become more volatile.

In spite of efforts from the international community to meet the water-related MDGs, the MDG sanitation target will not be met by 2015. The Bank, other multilateral banks, and bilateral donors have invested massively in water supply and sanitation, but such investments are necessary just to keep pace with a growing global population. IBRD/IDA increased its lending for WSS by more than threefold, from \$1.3 billion in FY03 to

\$4.3 billion in FY09.⁷⁶ Bilateral donors more than doubled their support for WSS, from \$2.2 billion in 2003 to \$5.5 billion in 2008.⁷⁷ A large fraction of the budget for large global programs has been devoted to sanitation, including \$21 million from WSP. Other players focusing on sanitation include the Gates Foundation, which has recently made a policy decision to focus on sustainable sanitation services, and UNICEF with its work on sanitation access for the poor. Most countries are on track to meet the water supply MDG target. The sanitation MDG target has fallen behind.

2. Core Business and Areas for Increased Attention

To address the large unfinished access agenda, the Bank will continue to focus on infrastructure for water services. The challenge of meeting access needs is large: the costs of exploitation and supply are rising: the easiest investments for exploiting water resources have often already been made, viable dam sites are harder to find, water tables are falling, and the distances between the point of abstraction and water use increasing. Costs have also been pushed up by the growing need to treat water before use.

Efforts to link the quantity and quality of water to infrastructure investments in service delivery will be continued. For example, flood-protection investments that target construction of infrastructure to reduce vulnerability will be complemented by a greater focus on strategic planning. While the Bank will not prioritize an increase in wastewater operations (sewerage, wastewater treatment works, and wastewater disposal) relative to

The current Water Resource Sector Strategy remains sound and relevant to address client needs. The Strategy was forward-looking, anticipating the issues of climate change and urbanization before they were at the forefront of global discussions. But the external environment is rapidly evolving.

other infrastructure, it will seek to support clients in better investment planning and operation. The Bank will favor irrigation projects that integrate water productivity, and water supply projects that link water use to resource management, over stand-alone irrigation and water supply projects. However, the actual mix will depend on clients demand and country strategies. The Bank will monitor the extent to which water services projects adopt a more integrated approach to water resource management by tracking over time the percentage of water projects containing a water resource management component.

Technological advances will present new opportunities to build client countries' capacity for results-based decision-making. The Bank will provide advisory services to

facilitate the integration of technologies on technological advances (e.g. remote sensing, early flood warning) in new projects. Several regional units will pilot new approaches to take advantage of these new sources of information, tackling these with existing data sources in projects. Bank assistance in building this capacity in client countries will respond to client needs for more reliable information for decision-making. Increased efforts in this area will also address IEG's recommendation on strengthening the use and supply of data. In the context of strengthening information on the impact of Bank projects, the Bank will continue to develop new core indicators, and implement those for water supply and sanitation projects. It is also expected that the implementation of results-based investment lending will support a greater focus on results.

But the external environment is rapidly evolving and the water agenda is growing in complexity, making it necessary for the Bank to be flexible and responsive to new challenges. The Strategy was forward looking, anticipating the issues of climate change and rapid urbanization before they were at the forefront of global discussions. It will, however, be critical to strengthen the core business of the Bank—infrastructure for access, integrated water resource management, capacity for results-based decision-making—with an increased focus on three areas: (a) water for climate change adaptation and mitigation (b) agricultural water management and (c) MDG sanitation targets.

Managing water for climate change adaptation and mitigation is a development issue. Going forward, the Bank will position water more actively at the core of climate

action, and a driving part of the solution. The Strategy provides sufficient ground for scaling up engagement in this area. It will require strengthening the links between water, environment, and energy and further investment in infrastructure and agriculture. The Bank will support countries scaling up programs by leveraging climate finance, including financing from the Climate Investment Funds and other sources.

The Bank will continue to strengthen the linkages between water, environment and energy. Among others, future activities include the preparation of an analytical framework for investment planning under uncertainty, a new framework of economic analysis, an assessment of the greenhouse gas impact of dams and water utilities, and a study of the role of hydropower on environmental flows. As part of its commitment to the implementation of the Strategic Framework on Development and Climate Change, the Bank has begun developing a screening tool for water projects and will explore how it can be implemented in water projects. The screening will take various forms, depending on the sub-sector, the country, and the vulnerability of the infrastructure. Water will also be an important component of the new environment and energy strategies (under preparation).

Adaptation to climate change will become a key driver of Bank investments and engagement. Ongoing efforts will be strengthened to address climate variability in Bank projects through improved storage, emergency response preparedness, flood control, water management, and coastal zone management. Well-functioning hydromet and early warning systems, sustainable infrastructure, and

institutional arrangements for coordinated action will have to be an essential part of an integrated flood management agenda. Adaptation in water will also address the challenge of “right-sizing” already constructed hydraulic infrastructure; the fill rates in dams that were designed based on past rainfall trends are projected to be seriously affected, depending on which of the rainfall scenarios hold true. Each of these scenarios has very different implications for agriculture water management, groundwater exploitation, and water supply and sanitation. Also, increased rainfall variability and changes to runoff and flooding patterns may require reviewing the incentives to collaborate among countries that share watercourses. Water diplomacy may have to move beyond benefit sharing toward risk sharing. Integrating climate change into the water agenda will introduce additional uncertainties in policy, planning and implementation of long-lived projects, affect the management/infrastructure mix, and increase the complexity of Bank interventions.

In terms of mitigation, the Bank will scale up support for hydropower and look for opportunities to improve the efficiency of water supply systems. Hydropower represents the largest source of renewable and low-carbon energy. The WBG Hydropower Business Plan projects to expand opportunities for hydropower projects in all regions of the world, not only those most active in the past. The big untapped potential in developing countries amounts to more than 1,300 GW of unutilized hydropower. While the WBG's actual investment will remain a relatively small share of total hydropower investments worldwide, triple bottom line practices are increasingly being adopted by investments in which the WBG does

not have any direct involvement. Efforts toward mitigation will also include encouraging the energy efficiency of water supply systems (replacing pumps) as well as emissions reductions related to water (wastewater treatment technologies to reduce methane emissions and mangrove carbon sequestration).

Supported by the recent World Bank Group Agriculture Action Plan, the Bank will scale-up its assistance in agriculture in general, and agricultural water management in particular. Support for irrigated agriculture will include: (i) market-oriented irrigation based on public-private partnerships; (ii) individual smallholder irrigation to high-value markets; (iii) small-scale community-based irrigation for local markets; and (iv) modernization of existing large-scale irrigation. The Bank will focus both on expanding irrigated areas where feasible, and improving water use efficiency of existing schemes. Sustainable water management will be supported through local water users associations, incorporation of broader river-basin management, and through improved use of shared watercourses, including support for cooperation between different riparians. Greater attention will be paid to strengthening the links between the different water using sectors, including multi-sectoral support for water management (e.g. multipurpose hydro). Support for rainfed agriculture will focus on improved water control, including broader watershed management. This will complement efforts to invest in more drought tolerant crop varieties. Investments in improved water management can be catalytic—reducing the barriers to adoption of otherwise costly soil and crop management practices by increasing the returns to these investments.

In an effort to put the sanitation Millennium Development Goals back on track, the Bank will continue to support low-cost onsite sanitation.⁷⁸ Experience shows that the MDG target of reducing the proportion of people without access to improved sanitation by one half by 2015 can best be addressed through low-cost onsite sanitation. Such efforts require a good deal of high quality software (e.g. policy dialogue, technical assistance, and sharing of experience), but not necessarily large borrowing. Other factors, such as IDA ceilings and reluctance from client countries to borrow for software make a lending target for Bank activities in sanitation inappropriate. The WBG will contribute by funding or co-funding critical technical assistance to promote the basic access agenda.

To respond to growing needs from client countries, World Bank Group water commitments, led by IDA and IBRD, are projected at between \$21 and \$25 billion over FY10–13. IDA/IBRD commitments are projected to grow steadily from FY10–13. IFC is preparing a new Business Plan, which will focus on five investment areas (water demand management and efficiency, wastewater treatment and re-use/sanitation and solid waste, water supply, distributed services, and innovative technologies). MIGA hopes to continue to work together with its existing clients to support more water and hydropower projects. At the same time, MIGA will endeavor to establish partnerships with new private investors and clients in this sector, support projects in more countries and expand into new sectors such as seawater treatment.

3. Operationalization of this Strategic Vision

To monitor progress in implementing the Strategy, a new results framework of the Water Sector Strategy was developed. While the Strategy adopted in 2003 did not include a results framework, the Bank developed such a framework in this report along the three strategic priorities of the Strategy—integrated water resource management for sustainable use, infrastructure for access, and client capacity for results-based decision-making. A set of indicators for the Bank, IFC and MIGA, was identified, with baselines and targets established for the next implementation period. Such framework links the overarching objective of the Strategy with WBG achievements, and will allow assessing whether and how the Strategy met its goals by the end of the implementation period.

3.1 Guiding Principles

The guiding principles of the Strategy remain valid. The Bank will continue to be guided by the principles articulated in the Strategy, including pursuing an integrated approach to water resource management, adopting a balanced approach to infrastructure and management, bringing corporate attention to more risky projects with long-term benefits, and following the “principled pragmatic approach” on water resource management.

The Bank will continue to follow the “principled pragmatic” approach of the Strategy on water pricing, balancing efficiency considerations with accountability, concerns for the poor, and the political economy of reform. At the project level, the Bank will continue to focus on cost

TABLE 3 ACTUAL AND PROJECTED WATER COMMITMENTS

US\$ Billions

	Actual	Projections*	
	FY06–FY09 Actual	FY10–13 Low Case	FY10–13 High Case
World Bank (IBRD/IDA) ¹	15.3	17.2	20.3
IFC ²	2.4	3.1	3.8
MIGA ³	0.3	0.3	0.4
World Bank Group	18.0	20.6	24.5

¹World Bank projections are based on the projection of INFRA targets through FY13, with the water sector (including hydropower) maintaining its historical share of infrastructure lending (31% from FY06–FY09). This estimate is also consistent with growth projections presented in the WBG’s Agriculture Action Plan and the WBG Hydropower Business Plan, which represent the two significant areas of growth in the Bank’s Water Business.

²IFC projections are based on IFC Business Plan (draft). FY09 actual figures reflect IFC new methodology looking at water projects beyond infrastructure (CIN dept.) and including water components in agribusiness, manufacturing and hydropower.

³MIGA projections are based on the MIGA’s Business Plan, FY10–12 and the historical share of water and hydropower sector guarantees from FY06–09.

Source: World Bank Group

recovery in water projects. Through a series of projects, the Bank will support the gradual coverage of costs, starting with O&M costs. To ensure that cost recovery is being addressed in each project, the Bank will conduct a more thorough review of the financial aspects of water projects (including the identification of subsidies and agreement with all stakeholders on how such subsidies will be funded), strictly enforce the projects' financial covenants related to cost recovery, and pay more attention to financial issues in water projects in general. Lessons learnt from 40 water PERs will be examined with a view to developing a standard methodology to enhance their effectiveness in engaging client countries on the allocation of fiscal resources and financing of water services. This work, in conjunction with the lessons

learnt on cost recovery from past projects, will help to inform on-going policy discussions on the efficiency (and conservation) of water use.

To achieve sustainability, the Bank will continue to focus on the quality of its engagement. The Bank will continue to improve the performance of the water portfolio (in terms of outcome ratings, realism, pro-activity and reducing the number of projects at risk). This is all the more important given that there has been a significant increase in the number and size of water projects, with significant back-loading of project design in project preparation. The Bank will continue to focus on the quality of its engagement in the sector through regular portfolio monitoring.

3.2 Staffing and Skills

The Water Anchor Unit will consider options for providing corporate support to fundamental water reforms in some client countries, bringing world-class strategic advice to support country teams. This will be part of a Bank-wide reform to establish global-expert practices in each sector.⁷⁹ These practices will operate as integrated, Bank-wide entities capable of recruiting and developing the best talent, manage knowledge generation and circulation across the Bank, and strengthen the networks with key knowledge centers across the world.

The Bank will address the issues of staffing and availability of appropriate expertise in three ways. First, the Bank will adopt a process of strategic batch recruiting. A recent Bank-wide matrix working group on mobility recommended that Sector Boards take a corporate view regarding strategic staffing, and the Water Sector Board was chosen as one of the three Sector Boards to

pilot the reform in staffing and HR management. Building on the recommendations from the recent skills review of the sector, the Water Sector Board will be piloting batch recruitment; thereby changing the way the sector (and the Bank) operates by approaching recruitment in a more collegial way rather than case by case. Second, the Bank will pursue strategic secondments from key countries and organizations that have expertise in the emerging technical issues. Third, the Bank will maintain expert support teams—forerunners to the global expert teams recently established in the Bank—that will call on global experts outside the institution.

Other proposals that are currently discussed in the water practice include integrating reviews of skills as part of the regular functions of the Sector Board. These annual reviews would form the basis of an annual operational and staffing strategy and result in a specific recruitment strategy for the ensuing six months. Sustained efforts to promote training of staff through various channels, including the Sustainable Development Learning Program, Water Orientation Course, and the six water-related thematic groups, will also be pursued.⁸⁰

3.3 Innovative Instruments

While the institutional settings and governance structure of most client countries do not encourage integrated planning, development and management of water resources, it will remain critical for the Bank to support a holistic dialogue with client countries on water issues. At the country level, the Bank will continue to use instruments, such as CWRAS, water PERs and SEAs as strategic tools to structure dialogue and engagement on water in an integrated way. To strengthen

the link between CWRAS and CAS, the Bank will develop a rapid assessment tool that can feed into the CAS and Country Economic Memorandum (CEM) discussions before a full CWRAS is undertaken. Water PERs and other analytical instruments will continue to support the dialogue with client countries on the issue of sustainability of water utilities and tariffs. The Bank will explore the new instrument that was developed by WBG/McKinsey can be applied in specific countries to support policy or lending initiatives of key strategic importance.

Political economy analysis will be used more systematically to support sector engagement in trans-boundary and GAC issues. To assist clients to improve development impact and reduce leakage of funds, the Bank will sustain its support for mainstreaming GAC in the water sector through direct support to operations, advisory services and knowledge management. Instruments and approaches introduced under the Bank-wide Investment Lending Reform will need to be tailored to the sector, and in particular, the Operational Risk Assessment Framework and results-based lending instruments.

The WBG will also explore opportunities presented by private finance, including mobilizing private financing for water utilities, and reforming public water utilities to improve their financial management through corporatization and similar structural efforts. Innovative use of guarantees, such as Partial Risk Guarantee type structure to backstop government action or inaction, or specific regulatory risks, will also be explored.

The Bank will position water more actively at the core of climate action, and a driving part of the solution. It will require strengthening the links between water, environment, and energy and further investments in infrastructure and agriculture. The Strategy provides sufficient ground for scaling up engagement in this area.

3.4 Institutional Structure and Incentives System

As part of the broader institutional reform effort under way, the Bank will continue to seek ways to address cross-cutting issues and promote cross-sectoral outputs. Several regional units, such as AFR and ECA, have been experimenting with various approaches to encourage inter-sectoral cooperation and promote cross-sectoral outputs. For example, in ECA, the program team leader for water resource management reports to both the sector manager of water supply and sanitation, and the sector manager of irrigation. Lessons learnt from these pilots will contribute to the on-going institutional reform effort, involving knowledge, matrix review, HR and decentralization. Since it is now increasingly recognized that IWRM is the best available model to increase the resilience

needed to adapt to climate change, the Bank's repositioning toward addressing global challenges, such as climate change, will offer new opportunities to promote further the cross-thinking and align the structure and incentives system to respond more effectively to a complex, rapidly evolving environment.

3.5 Corporate Engagement on global/regional issues

While the Bank model is geared toward effective engagement at the country level, it will also have to find ways to respond to issues that cannot be tackled at the country level. Traditionally, the demand for water has been determined by forces and processes generated by human activities: demographics, spatial population shifts, and increasing consumption that comes with rising per capita incomes. Those factors have fallen mostly within country boundaries. With the growing recognition of the relevance of climate change for the sector, there has also been recognition that the sources of pressure on water lie beyond country boundaries, making the task of managing resources appropriately even more complex. Engagement in global or regional issues, such as water-sharing arrangements in international river basins, engagement in major dams (e.g. hydroelectric power in the Congo basin), and more specific issues, such as drainage of peat land in Indonesia, cannot be tackled at the country level. By focusing exclusively on a country-level model, there is a risk of losing sight of these issues which may require attention, not only from country directors, but also from senior management. Strategic corporate decisions will need to be made on whether or not to engage in these issues of global importance with support from all parts of the WBG.

The Bank's repositioning toward addressing global challenges, such as climate change, will offer new opportunities to promote further the cross-thinking and align the structure and incentives system to respond more effectively to a complex, rapidly evolving environment.

Endnotes

75 On biofuel production, see *Liquid Biofuels: A Background Brief for the World Bank Group Energy Strategy*, Kojima Masami, 2010

76 The World Bank business in water supply is guided by the *Water Supply and Sanitation Sector Business Strategy: FY2003–07* (September 2003), update (Sector Strategy Implementation Update FY05, CODE2005-0100, November 8, 2005) and remains valid.

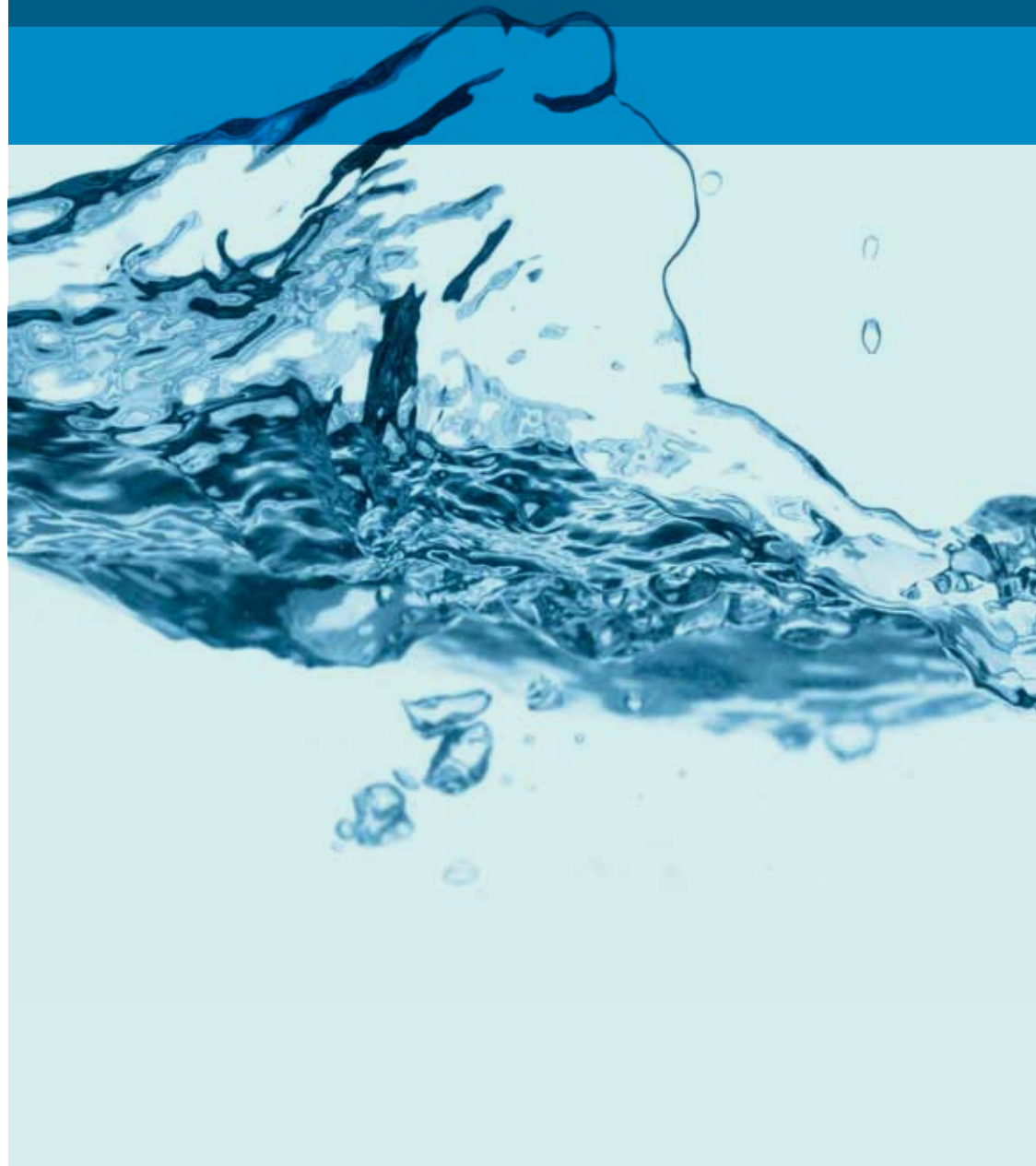
77 OECD, International Development Statistics (IDS) online databases, accessed January 2010.

78 Consistently with the 2010 Hashimoto Action Plan II, UN Secretary-General's Advisory Board on Water and Sanitation, to galvanize the international development community in sanitation.

79 *Knowledge Strategy* (Draft Board paper), Knowledge Strategy Group, World Bank, 2010.

80 World Bank Institute is developing a new course on integrated water resource management for client countries.

Annexes



Annex A

Implementation of the Strategy on the Ground—Seven Country and Regional Cases

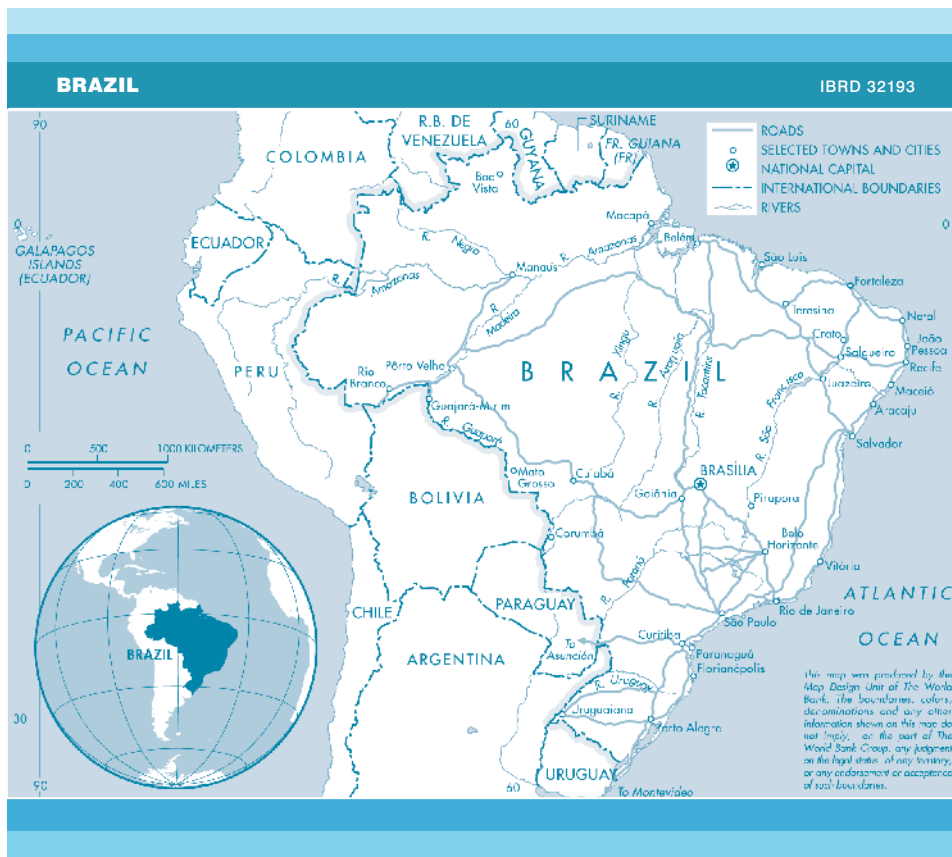
The WBG has been working with client countries to address a wide range of water issues, from access to drinking water, to supporting cooperation among riparian countries, nurturing institutional reforms, addressing risks of floods and droughts, restoring ecosystems and promoting sustainable irrigation. Seven country and regional cases that were discussed in the Strategy will be used to illustrate how the Strategy was translated into Bank actions (Brazil, Central Asia, Andhra Pradesh, Nigeria, Philippines, Yemen, and Nile Basin Initiative). Although the Strategy did not cover IFC and MIGA, efforts have been made to report on IFC and MIGA activities, and how they have complemented Bank's activities as well. The country cases show that the challenges facing different countries and regions vary widely, and that WBG support has varied widely accordingly. This diversity notwithstanding, it is clear that in most settings, WBG engagement has involved a mix of financing, knowledge and capacity building.

It is important to note that WBG activities in a particular country are the outcomes of a combination of three factors: (a) the nature of the challenges in the country; (b) the Country Assistance Strategy, in which the government and the Bank/WBG agree on priorities and approaches; and (c) the sector strategies. While the sector Strategy has provided the overarching framework to guide Bank assistance in the sector, these country and regional cases also show that the Bank has responded flexibly to address country needs and ensure ownership of assistance programs.

1. Brazil

Issues

Despite Brazil's huge endowment of water resources and significant achievements over the last 50 years in water resources development and water services expansion, important challenges remain. While the country is blessed with significant water resources, they are unevenly distributed across the territory. Furthermore, there is an institutional complexity to the legal framework governing water in Brazil which, through the country's federalist structure, provides important roles to federal state and municipal governments in different aspects of water resources management (WRM) and water supply and sanitation (WSS). The federal government regulates concessions regarding federal rivers, for example, but has no control over water use at the basin or state level. Water transfers are highly political, and there are no established market mechanisms to minimize conflicts. Water scarcity is prevalent in the northeast region and in some large metropolitan areas, such as São Paulo. In urban areas, degradation of water quality is a major issue as a consequence of untreated wastewater discharges from municipal, industrial, and agricultural users. Water also plays a key economic role through the development of hydropower and navigation infrastructure. However, decisions concerning water allocations to hydro-power schemes take place without specific rules regarding environmental and navigational use or compensation, often leading to regional disputes. Furthermore, hydro-power schemes are not leveraged to achieve a financing role for river basin development. Irrigated land has increased by at least one third in Brazil over the last decade.



Such infrastructure development and allocation of water across competing uses often involves complex trade-offs between environmental conservation and economic development. The financial resources required to meet universal coverage of WSS services far exceed recent investment levels. Nevertheless, Brazil has made many important legal and institutional reforms in the water sector since the mid-1990s, and their National Water Agency (ANA) is considered to be a world-class water management institution. In terms of WSS service provision, Brazil has a full spectrum of models and of sector efficiency, ranging from world class to very weak utilities, from fully public state utili-

ties to those floating shares on the national and international stock exchanges, and from public to private concessions at the municipal level. The 2007 Federal WSS Law brings long-awaited clarity to the roles of different levels of government in sector regulation, planning and service delivery. However, institutional capacities at state and local levels remain weak in many cases, hindering further substantial improvements in water management. Meeting the challenges related to the country's water resources and water services requires further strengthening of policies and institutions, replication of successful institutional models, as well as investment in viable infrastructure development projects.

Proposed Directions for Bank Engagement in 2003

The 2003 Strategy highlighted four main lines of action for Bank assistance to Brazil: (i) continued support through investment and advisory services to WRM programs in states that undertake water reforms, with focus on the Northeast; (ii) continued support to complete reforms in the WSS legal and regulatory framework, with particular focus on efficiency, expansion of coverage to the poor, and reduction of water pollution in selected urban river basins; (iii) support for developing institutional arrangements and financing priority investments in a few stressed river basins, with focus on the Paraíba do Sul and São Francisco river basins; and (iv) support to ANA's federal programs and institutional strengthening by helping the agency to develop adequate partnerships and arrangements with states, with a focus on improved water-rights administration at federal and state levels and more effective water management in priority basins. The 2003 Strategy also stressed that many in the Brazilian water sector wanted the Bank to be engaged in the more complex and difficult issues, including major hydraulic infrastructure projects, where the value added by the Bank was perceived to be higher.

World Bank Group Achievements over FY03–09

Over FY03–09, Bank assistance in the water sector in Brazil has been consistent with the above directions. The Bank has maintained a successful parallel track strategy associating support to the federal government in its planning efforts and institutional reforms (for both the WRM and WSS sectors) with support to selected states

where there was strong commitment to implementing water reforms.

From FY03 to FY09, the water sector portfolio included 16 projects, representing US\$949 million in investment lending. The WRM portfolio accounted for US\$542 million. At the federal level, the Bank-financed Federal Water Resources Management Project (PROAGUA) has been the main instrument to provide support to ANA and to improve water resources management in the dry and impoverished northeastern states with some investments in priority infrastructure, including the rehabilitation and construction of dams and pipelines. Engagement with selected reforming states, such as Ceará, Bahia, and Rio Grande do Norte, has been maintained through state specific investment lending operations that also linked infrastructure investment to improved WRM (legal and regulatory improvements, information systems, state and river basin planning, and institutional strengthening). A new policy-and output-based operation in Bahia state is under preparation that combines institutional and investment activities in both WRM and WSS.

Over the same period, the WSS portfolio comprised US\$407 million: US\$55 million was for federal operations (PMSS 2 and PROSANEAR-TAL), US\$211 million for state operations (Espírito Santo, Pernambuco Prometropole, and Federal District), and US\$141 million for municipal operations (Betim, Uberaba, Teresina, Recife and São Luis). PROSANEAR helped develop and test methodologies for undertaking the preparation of participatory engineering designs for integrated WSS and urban development interventions in densely occupied, low-income urban communities throughout the country. PMSS contributed to the development of national policies, the undertaking of

cutting-edge sectoral analytical work, coordination among stakeholders, supporting the national WSS benchmarking database, and the carrying out of an important role in the formulation and approval of the Consortia Law and the Federal WSS Law, among other endeavors. The Bank has also engaged in a new generation of state and municipal projects with an integrated, watershed-oriented approach to urban water management and pollution control in a variety of states (São Paulo Metropolitan Region Espírito Santo, Federal District, Pernambuco Water and Sergipe Water) and municipalities (Betim, Uberaba, Teresina and Recife), as well as to an innovative output-based project in water scarce basins throughout São Paulo state. At the other end of the scale, it is financing a project in Amazonas State to develop a new WSS service model for small towns in the state's interior.

The World Bank portfolio has also included two environmental DPL operations with WRM and WSS components. The first in 2004, in the amount of US\$502 million, supported the preparation of the National Water Resources Plan (PNRH) and the increased use of bulk water charging as a water management instrument. The second DPL operation, approved in 2009 in the amount of US\$1.3 billion, focuses the water-sector supported actions on water quality management and wastewater treatment. PRODES, the output-based pilot wastewater collection and treatment program which had financed 42 wastewater treatment plants by 2008, and the National Water Quality Evaluation Program (PNQA), which was launched in 2008 to improve the knowledge base for policy making and implementation regarding water pollution control and water quality management, are also supported by the Bank DPL for environmental management approved in 2009.

IFC has undertaken a number of activities in the Brazilian water sector between 2003-09, including the following: (i) *Andrade Gutierrez Concessões S.A.* signed a US\$50 million deal in December 2007 comprising a US\$25 million A loan and a US\$25 million standby facility to support its PPP activities in their water supply and wastewater collection and treatment programs throughout the country; (ii) an advisory engagement with the federal government to assist in structuring its Pontal PPP irrigation scheme in the semi-arid northeast, which should create some 22,000 direct and indirect jobs; and (iii) a recently signed commitment with *Foz do Brasil* to provide US\$75 million in financing in wastewater treatment for reuse schemes around the country.

Recent activities of the World Bank/IFC Subnational Financing Group offer a promising line of business for supporting state and municipal WSS utilities in standalone operations (Santa Catarina and Campinas) and in complementary operations to support Bank lending (Sergipe and Rio Grande do Norte), encompassing macro and micro metering programs on the water-supply side, and wastewater treatment and effluent reuse in the sanitation sector. MIGA have had no activities in the water sector in Brazil during the MCIPR evaluation period.

Following a period of economic stability, Brazil launched its flagship *Growth Acceleration Program (PAC)* in early 2007 which significantly increased federal investment in infrastructure, including large and complex water infrastructure as well as WSS service provision. The Bank played an important advisory role regarding some of the major water infrastructure being implemented under the PAC, including technical assistance on designing the Rio Madeira hydropower auction process and recom-

mendations regarding the São Francisco Interbasin Water Transfer project. Also in 2007, Brazil passed a national WSS law that clarified the sector's planning, regulation, service provision, and other roles and responsibilities for each of the three levels of government in the sector. The Bank-supported federal PMSS program played a key role in contributing to the different draft versions of the long-awaited WSS law. From US\$11.4 million of participatory engineering designs, the Bank-financed PROSANEARTAL leveraged US\$600 million of PAC investments in integrated urban WSS and complementary services in over 30 poor urban communities throughout the country. The TAL also produced a manual for the preparation of participatory engineering designs that was taken as the basis of the federal government's own manual for preparing such interventions for PAC funding. In the irrigation sector, a national policy and law is under discussion in Congress aimed at improving public investment, efficiency, and sustainability of irrigated agriculture. Within this context, the federal government has been preparing, with technical support from the Bank and IFC, the first two irrigation PPP projects in the country.

Between 2003 and 2005 the Bank produced the *Brazil Water Series* with a number of technical reports covering themes such as: the effectiveness of decision support systems for water rights administration in Brazil; the analysis of integrated urban water resources management and related WSS, drainage, land-use and other issues in the Metropolitan Region of São Paulo; WRM and WSS policy recommendations for federal and state governments; and analysis of national and international experiences of inter-basin water transfers. The Bank also produced a report, *Brazil: management of water qual-*

Structural reform processes have their own pace and timing and require participation of a wide range of stakeholders as well as firm government commitment at different levels. It is important to address institutional objectives in the context of long-term programmatic engagements, rather than individual projects.

ity, which presented conclusions from the Bank's involvement in urban water pollution control projects in the country, and a series of BNWPP-funded studies including one that analyzed institutional models for small town and rural WSS service provision in the country. In 2004, the Bank prepared the *Irrigated Agriculture in the Brazilian Semi-Arid Region: Social Impacts and Externalities* publication and, in 2008, launched the *ESW Environmental Licensing for Hydroelectric Projects in Brazil: A Contribution to the Debate*. The Bank-financed PMSS has produced a number of strategic analytical studies and think pieces (including those concerned with the costs of universal WSS service provision; PSP in the Brazilian WSS sector; and condominium sewerage). This compendium of studies have provided valuable inputs to Bank operations as well as contributing to dialogue with sector stakeholders at the different levels of government.

Lessons Learnt

As emphasized in the 2003 Strategy, water reforms take time and persistence to succeed. The Brazilian case clearly shows that structural reform processes have their own pace and timing and require participation of a wide range of stakeholders as well as firm government commitment at the different levels. In a federative and highly decentralized country like Brazil the reform process can be particularly complex and time consuming. Thus, it is important to address institutional objectives in the context of long-term programmatic engagements, rather than individual projects; this will require persistence, patience, follow up and flexibility in the Bank's assistance.

The main water issues in Brazil will not be resolved without stronger institutions at state and municipal levels improving technical capacity, credibility and stability. Incentives for efficiency and adequate regulation are also issues that the water sector needs to address. Assessments of climate change impacts on the sector, and the development of adaptation and mitigation measures need consideration, with emphasis on critical climatic regions and on priority national rivers and watersheds. Fiscal space for expanding expenditures in public administration is very limited and fiercely disputed with other important sectors. Within this context a gradual approach must be followed and, as highlighted in the 2003 Strategy, selectivity and sequencing are extremely important. Principled pragmatism and patience are also often required in Brazil to maintain dialogues between changes of administration on both the side of the government and within the Bank.

The first generation of Bank-financed Water Quality and Pollution Control ('PQA') projects in São Paulo, Curitiba, Belo Horizonte and Espírito Santo were positively

reviewed in IEG's 2007 PPAR, presenting, *inter alia*, the following conclusions: (i) The PQAs laid the groundwork for a new approach to managing water quality in large urban areas, breaking the conventional mold and representing important new standards of policy and practice in Bank assistance to the water sector in Brazil, establishing the rudiments of global best practice in urban WRM involving the poor; (ii) The projects moved the emphasis to a basin-wide scale to achieve quality and efficiency objectives in dense urban areas, while learning that the water quality challenges were inextricably linked with urban poverty issues; (iii) Brazil is still decades from consolidating the approach to sustainable urban water resources and land use management; (iv) No separate project approach, be it slum upgrading or WSS alone, has succeeded any better than the PQA hybrids in regard to water quality objectives; and (v) The projects contributed to an understanding of how to manage difficult intersectoral issues involving the many actors in Brazilian metropolises;

Despite positive experience of cross-sectoral work in the Brazil water portfolio, the Bank's ability to work across sector silos is an ongoing challenge that requires further effort, including a change in incentives and internal processing practices including: (i) the shared mapping of projects across the water and related portfolios so that sector units get balanced recognition; (ii) recognition for staff working on projects not mapped to their unit; and (iii) increased use of local staff who find it easier to break across silo boundaries.

Directions for Future World Bank Group Engagement

An updated water sector strategy was prepared by the Bank as part of the prepara-

tion of the 2008–2011 Country Partnership Strategy (CPS). The strategy has defined six main lines of business and opportunities for Bank engagement: (i) improving water resources management, (ii) expanding and improving water supply and sanitation, (iii) developing more effective irrigation, (iv) integrating water and urban environmental management, (v) supporting multi-sector, integrated approaches to complex infrastructure, and (vi) addressing climate change and other issues of regional and global concern.

Within and across each business line, the Bank will focus on the following thematic issues: (i) strengthening of policies, regulatory frameworks and institutions; (ii) improving sectoral and investment planning and project monitoring instruments; (iii) introducing innovative service delivery models (for example, PPPs in irrigation and in urban WSS, corporate governance and access to financial markets by state owned operators, results-based approaches for efficiency gains, models to expand services to the poor especially in small towns and rural communities); and (iv) international exchange of best practices, especially related to economic instruments.

As directed in the CPS, Bank assistance at the federal level will be largely TA-based with the primary objective of strengthening the enabling environment to allow the PAC objectives to be substantially met. First, there is a need for a consolidated approach to infrastructure planning to coherently and systematically identify and prioritize long term infrastructure and management needs. Sectoral plans have commonly been structured in isolation of each other, and better coordination among the multiple entities involved in infrastructure in Brazil is required. Second, there is a need to increase

the availability of bankable projects (in terms of quality, technical viability and cost benefit analysis), and the ability to bring them to fruition, taking into account the generally low technical capacity of executing agencies and the lengthy administrative processes (at feasibility study, design preparation, bidding and environmental licensing stages). Strengthening public sector decision-making and executing agencies' capacity and streamlining of procedures are among the key solutions to these problems. Third, some regulatory and policy gaps still need to be addressed to complete the reform agenda and to consolidate the policy framework in some sectors in order to eliminate uncertainties and make better use of public funds to leverage private investment.

Within this context, the federal government and the Bank have started the preparation of a new US\$98 million lending operation in the water sector, *Interaguas*, to help improve the federal government's capacity to promote more effective and productive use of water resources by tackling a number of the key challenges described above (in water resources management, water supply and sanitation, irrigation, hydropower and navigation), with a focus on piloting such integration in selected priority national river basins. The Bank should support the development of improved corporate governance generally in the water sector and of new corporate WSS utility models more specifically, drawing on, for example, the successful experiences of SABESP's and COPASA's public-private governance model. In addition to the second generation of PQA projects (notably Espírito Santo additional financing and São Paulo Integrated Water Management 'Mananciais'), a new generation of state level operations have been prepared in Pernambuco and Sergipe that incorpo-

rate a broad and comprehensive approach to integrating WRM, urban and rural WSS, irrigation, solid waste management, and urban drainage, and that include integrated planning, sector regulation, and corporate governance of sector entities.

At the state and municipal levels, operations would continue to support a combination of infrastructure investment and improvements in service delivery, as well as in policy, regulations, and institutions. There are five operations (US\$529 million of lending) already in advanced stages of preparation, under negotiations, or recently approved by the Board: São Paulo Mananciais (US\$129 million), São Paulo Reagua (US\$78 million), Pernambuco Water (US\$190 million), Sergipe Water (US\$72 million), and Bahia Water and Health SWAp (US\$60 million).

In regard to high-risk high-reward projects, current demand for Bank support at the federal level is for technical assistance as the GoB has sufficient resources to finance its priorities. The Bank will continue to provide technical assistance to prepare and deliver PPPs to help Brazil further realize its irrigation potential.

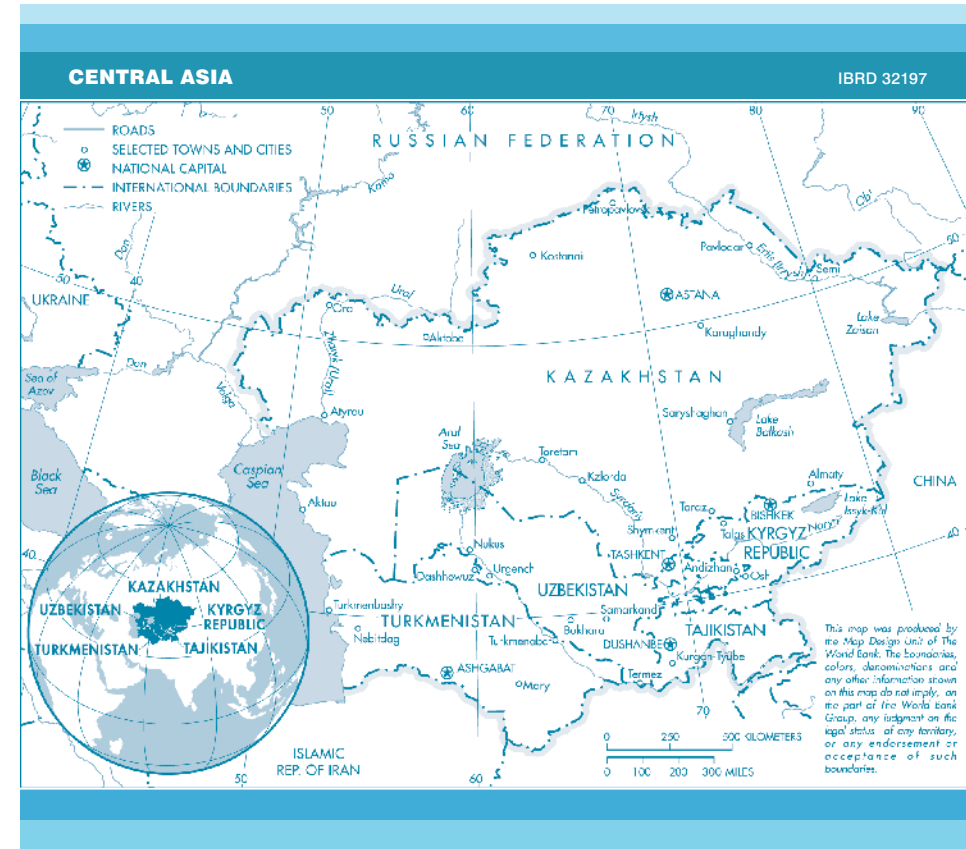
Examples of Bank planned and ongoing activities in Brazil that will respond to a number of IEG's recent recommendations include the following: (i) *Coastal Zone Management*—the proposed Sergipe Water Project will support the demarcation and management of protected natural resources in the coastal area of the Metropolitan Region of Aracaju, particularly the mangroves and natural lagoons as well as other urban interventions to improve CZM in the region; the ongoing Espirito Santo Water & Coastal Pollution Management Project involves wastewater collection and treatment and other environmental interventions in the state's regional coastal capital; (ii) *Groundwater Management*—the Bank

has obtained GW-MATE funds to undertake a study of urban groundwater in selected Brazilian cities with the objective of providing lessons and recommendations for policy definition; the Pernambuco and Sergipe State Water projects include studies and management tools for groundwater; (iii) *Sanitation*—Many of the Bank's ongoing and planned operations include institutional and investment activities related to urban and/or rural sanitation including São Paulo Reagua and Mananciais; Bahia SWAp, Espirito Santo, Sergipe, Amazonas and Pernambuco state projects and Teresina, Uberaba, Recife and São Luís municipal operations; and (iv) *Supply and Use of Data*—the proposed federal *Interaguas* project will support ANA's national water resources information system and the Ministry of Cities national WSS benchmarking database, the Espirito Santo state project is using an information system to inform the public and monitor/regulate the WSS sector, and Pernambuco and Sergipe state water operations will support the development of state water resources information systems.

2. Central Asia

Issues

The Central Asia sub-region comprises five countries with a total population of 59 million over an area of 4 million square kilometers. There are large differences in available water resources, from Tajikistan with an average of 4,900 m³ per person annually, to Turkmenistan with only 274 m³ available per person annually. Tajikistan and the Kyrgyz Republic include the major glaciated mountains of the regions and their upstream position is advantageous for water availability and hydropower. In contrast, Kazakhstan, Turkmenistan, and Uzbekistan are in a downstream position and are largely dependent on inflow from the other Central



Asian republics. Agriculture is a key component of the region's economy and accounts for 90 percent of its water use. Following the collapse of the Soviet Union in the early 1990s, most of the region's water infrastructure continues to decay as the result of unsustainable development and the lack of financing for maintenance and rehabilitation. The national budgets remain inadequate to cover the costs for maintenance, and investments for rehabilitation from IFIs have not been sufficient to reverse the deterioration. Soviet-era legacy institutions for funding infrastructure operation and maintenance have not been sustainable. While each state still has operational irrigation or water resources departments,

further reforms and sustainable financing has proven to be a continuing challenge. The Soviet Union's mismanagement of the Aral Sea basin resulted in an ecological, economic, and social disaster. While there has been significant progress in repairing the Northern Aral Sea, significant water resources management challenges remain.

Proposed Directions for World Bank Engagement in 2003

The Strategy stressed the importance of both management and infrastructure instruments, with a focus on rehabilitation and maintenance of an appropriate stock of

infrastructure. Major aspects of the 2003 Strategy included (i) the development of a regional water strategy, (ii) continued analytic and advisory work to better understand the economic, social, and environmental impact of rehabilitation, energy use, water and salt strategies, and water and waste water strategies, (iii) a focus on infrastructure rehabilitation, (iv) restoration of negatively impacted ecosystems (wetlands, grasslands, fisheries, etc) and especially the Aral Sea, and (v) continued restructuring of water utilities and support for water user associations.

World Bank Group Achievements over FY03–09

For the period 2003–2013 the World Bank will have provided investments in the sector for nearly US\$1.5 billion. Other multilateral donors, including the Islamic Development Bank (IsDB), Asia Development Bank (ADB), and European Bank for Reconstruction and Development (EBRD), along with many bilateral donors also continue to be active. International assistance has helped rehabilitate and maintain some of the infrastructure in key cities and productive centers, but the region-wide situation remains serious. The restoration of the Northern Aral Sea is a major success story for multilateral donors—both for the ecosystem and the communities that now can enjoy fishing and a cleaner environment. Nevertheless, the problems of inadequate institutional capacity and governance have been further weakened by the emigration of qualified professionals. Governance arrangements and incentive policies still lag behind and pose a serious impediment to the development of modern and efficient water management systems. Climate change is expected to have a significant impact in the region—with the Climate

Vulnerability Index (CVI) ranging from medium to high for all countries; the only positive exception being Kyrgyz Republic with a low CVI.

The Strategy defined the challenges of water resources management and development in Central Asia as daunting; solutions would require concerted actions across sectors. The World Bank work in Central Asia has focused on a number of elements discussed in the Strategy that still remain relevant.

While an overarching regional water strategy and action plan is still not in place, national water strategies have been prepared addressing subsector issues such as water supply and sanitation. The development of a regional strategy is difficult due to the underlying political differences among countries where an agreement on upstream-downstream water use is still not in place. The Bank has generally supported this effort with investment support that is complementary and consistent with regional sharing. The Bank also works with United Nations and bilateral organizations whose goals are more directly related to an enhanced political environment for shared water management.

Since the WRS was issued in 2003, a WSS dialogue was held in Kazakhstan between 2004 and 2005 followed by a TA on tariff settings completed in early 2009. Two water supply and sanitation sector notes were prepared in Uzbekistan and Tajikistan. The latter was launched with a workshop attended by national authorities and donors in April 2009, while the note for Uzbekistan will be publicly launched in mid-2010. In Tajikistan, the strategy note has galvanized government and donor attention, providing a platform to continue the dialogue and promote necessary reforms. For the critical irrigation sector in Uzbekistan, the Bank completed a report in late 2009 to help rank and prioritize

investment funds for rehabilitation and modernization of systems. In cooperation with the Uzbek Technical Working Group, 26 critical investment projects have been assessed.

Restoration of the North Aral Sea has been a major success in the region; as water levels increased by about 3 meters, adding about 50 percent to the surface area of the North Aral Sea, the once vibrant fishing industry was resurrected. Work has continued with the first phase of the financial assistance that will be completed at the end of 2010, and a new project is in the pipeline for 2011. Other rehabilitation projects have been financed in many Central Asian republics, although IDA allocations have limited the size of projects in Tajikistan and Kyrgyz Republic. Financing dedicated to address water pollution from mining and industrial water has been ongoing, especially in Kazakhstan.

Within the framework of the irrigation projects in Kyrgyz Republic, Tajikistan and Uzbekistan, water users associations have been supported and their capacity enhanced to operate and maintain the systems and collect fees. However, the centralized management system inherited from the Soviet era has slowed institutional reforms. The management contracts tested in Tajikistan and Uzbekistan have not been successful and a new paradigm needs to be explored to enhance the performance of the water utilities.

In the Kyrgyz Republic, about 570 WUAs were legally established for the management of over 750,000 hectares under the first On-farm Irrigation Project. WUAs were trained and supported for several years by dedicated WUA support units that were set up in the Department of Water Resources in order to develop the WUAs into technically and financially sustainable organizations. Realizing that WUA development is a long-term activity, this support continues under

Experience from project implementation suggests that rigorous economic and environmental criteria should always be applied in project planning and design, and that the involvement of local institutions and affected populations is critical to enhance ownership of projects.

the second On-farm Irrigation Project. In addition to WUA development, the two projects support the rehabilitation and modernization of WUA-managed irrigation systems commanding about 160,000 hectares. IDA also supports the rehabilitation and modernization of higher-order irrigation systems commanding over 400,000 hectares managed by the Department of Water Resources. The Irrigation Rehabilitation Project (closed) and Water Management Improvement Project (ongoing) also support efforts to transform the Department of Water Resources into an agency that is technically capable of managing complicated irrigation systems in a financially sound manner, with full transparency and accountability to water users.

The Tajikistan Ferghana Valley Water Resources Management Project (FVWRMP) has been under implementation since 2006. The project addresses the water resources management issues in Ferghana Valley in

Tajikistan which is a part of the Syr Darya River catchment area. FVWRMP includes several elements of integrated water resources development including the rehabilitation of irrigation and drainage systems for about 30,000 hectares in the valley, as well as the establishment of a number of WUAs, reducing flood risk and improving the operation and safety of the Kayrakkum Dam on the Syr Darya River. Although the funds allocated to this project are modest (total project cost is only US\$14.0 million), the project has already had positive impacts on the lives of the people living in the project areas through increasing agriculture production and reducing the risk of flooding and waterlogging of agriculture land. In addition, under the project, a number of studies and steps have been taken to improve the safety of the dam, including geo-technical investigations, surveys, and a study to improve dam safety, as well as the preparation of the dam safety monitoring and emergency action plan.

Lessons Learnt

The Strategy presents a clear picture of the sector and socio-political context of Central Asia and is still valid today. Experience from ongoing project implementation in Central Asia suggests that rigorous economic and environmental criteria should always be applied in project planning and design, and that the involvement of local institutions and affected populations in project preparation is critical to enhance ownership. Coordination among government agencies is difficult, and this has to be taken into account for cross-sector activities that involve an integrated approach to water management.

Dialogue among countries on equitable use of water resources and international water ways remains challenging. Growing

demand for power supply and construction of large impoundments from countries upstream creates tensions with their downstream neighbors.

The practicality of bringing about institutional strengthening of water supply and sewerage utilities through a performance based management contract (as had been the intent under the Bukhara and Samarkand Water Supply Project and the Dushanbe Water Supply Project) needs to be re-examined. In the future, a more flexible approach should be adopted balancing weaknesses in local capacity with external, preferably domestic, partnerships to strengthen operational performance.

Given the importance of irrigated agriculture in Central Asia, infrastructure rehabilitation, capacity building, and improved water management technologies have brought great benefits to the people of Uzbekistan, especially in the poorest areas. Continued infrastructure rehabilitation and modernization is crucial for the development and livelihood of rural areas. The benefits of system rehabilitation would be even greater if it was accompanied by sustainable agricultural reforms; water management should not be seen in isolation from the rest of the agricultural production process.

The capacity of water user associations should be strengthened to support improved water distribution in Uzbekistan, especially given the lack of reforms in the state-run agricultural sector in which the government is responsible for O&M.

Directions for Future World Bank Group Engagement

Through its investment lending and analytic work, the Bank has engaged the principal aspects of water management defined in the Strategy with a focus largely

on rehabilitation and national sub-sector reform. In order to move the water agenda forward, more substantive reforms and updated management instruments—on the national level but reflecting regional concerns—will require even greater effort from all stakeholders.

Several projects have been proposed to address the restoration of ecosystems and improved use of water supply for sustainable irrigation. A major project will continue the revitalization of the Northern Aral Sea and promote the sustainable use of water from the Syr Darya River. A second project seeks to improve agricultural production in areas of Uzbekistan affected by waterlogging, and to reduce damage to housing and infrastructure from rising groundwater levels and salinity in the project areas. Another major irrigation and drainage project is planned for irrigated agriculture in Kazakhstan that will expand service delivery and land and water management in order to increase sustainable productivity. This will be achieved through rehabilitation and modernization of irrigation and drainage systems, better management, operation, and maintenance of these systems, and more efficient use of associated irrigated lands, all with broad participation of users.

Rehabilitation, especially in the areas of water supply and sanitation, is also a priority. The Bukhara and Samarkand Sewerage Project will seek to improve Uzbekistan's municipal services, which have severely deteriorated and are often energy inefficient. Maintenance is necessary to improve service reliability, thus improving the public's quality of life and supporting economic growth. The proposed Syr Darya Water Supply Project will improve the coverage, quality, efficiency, and sustainability of public water supply services through rehabilitation and/or replacement of the existing water supply infrastructure that

has now reached the end of its useful life.

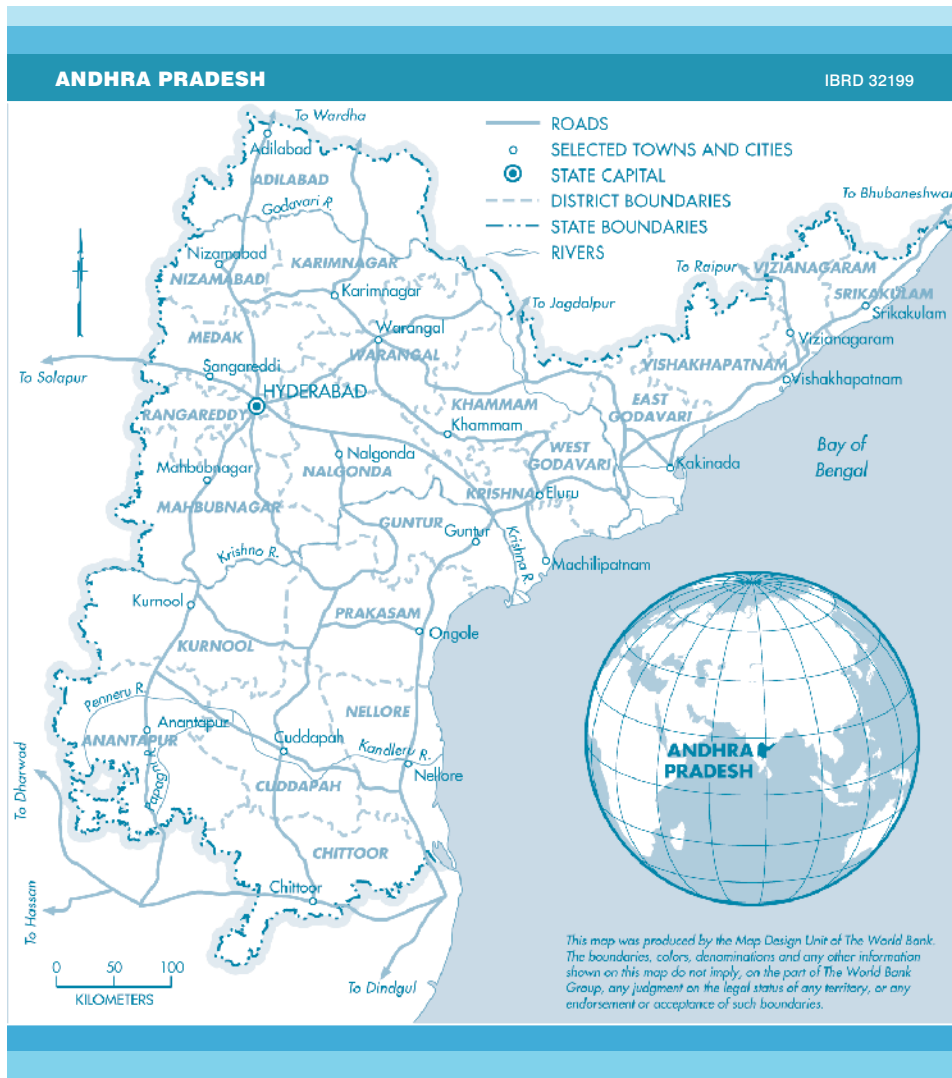
In terms of analytical and advisory work, the Bank's advice is increasingly sought on the sustainable development of hydropower resources in the Region; issues include domestic energy needs, the potential for energy trade/exports for poverty alleviation, and broader transboundary water management considerations. Apart from sustainable development considerations, Bank engagement will support a broader goal of building cooperation at the political level. Technical assistance support is being augmented by pilot projects on adaptation to climate change in vulnerable sub-sectors and regions.

3. Andhra Pradesh

Issues

Water resources management and development has played a major role in development, food security, and poverty reduction in India. The World Bank has been a key partner for India in water development over the decades, including assisting in negotiating the historic Indus Water Treaty with Pakistan and in providing the investments in water development projects that underpinned the treaty.

The Strategy noted that while important opportunities exist for the development of water resources, major challenges for India include getting the greatest productivity from existing resources, paying greater attention to the environment, and managing scarce resources in an efficient and accountable manner. The Strategy noted that public irrigation agencies were inflexible and ineffective in providing food security, rural development, and poverty reduction. As the largest water-using sector, irrigation is the key to improved water resources management in India.



A critical turning point came in the late 1990s with the World Bank's focus on reforming states. The first and strongest reformer was the government of Andhra Pradesh. Drawing on international best practice, the Bank provided strong support for the introduction of water user associations as a first step in this reform process. With strong political and bureaucratic leadership from the

state, water user associations were formed in all the state's public irrigation systems and showed early signs of success.

Proposed Directions of World Bank Engagement in 2003

Global experience shows that water user associations are a necessary, but not

sufficient, condition for improving irrigation performance. Equally important is reforming the way in which managers of the infrastructure perform. The state government of Andhra Pradesh realized this next challenge, and held discussions with the Bank 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.

On the water resources side the challenge in Andhra Pradesh was to assist the state in its efforts to be a facilitator. For example, the state has made substantial advances in the collection of data, but interpretation and use of those data for decision making lag behind. The challenge includes developing a legal, regulatory, and institutional basis for making water reallocation more flexible and voluntary, with careful attention to the highly sensitive issue of the water rights of users and to ecological requirements. These are key elements of an integrated river basin approach to water management, a central principle in the Indian National Water Policy and in the water policy of most Indian states, and 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, and that will require a sequenced, prioritized program of actions tailored to evolving political realities.

In the urban water sector, the Bank focused on analytical and advisory services in states that have shown commitment to fiscal and institutional reforms.

India has substantial undeveloped hydropower potential, but the electricity sector still has major institutional and financial problems. The Bank has declined to finance the development of new generation capacity

(including hydropower) and would only consider re-engaging if there are fundamental energy sector reforms.

The World Bank is actively engaged in Andhra Pradesh in the provision of knowledge and advisory services: on the water components of the state's "2020 Vision" document, on benchmarking and irrigation reform options, on utility reform, on groundwater management and on water rights administration and ecological flows.

World Bank Group Achievements over FY03–09

Irrigation reforms have been pursued with World Bank support through the Third Andhra Pradesh Irrigation Project (AP-III) and Andhra Pradesh Economic Restructuring Project. Experience from those projects indicates that further reforms are needed to broaden and deepen statewide sector reforms while improving sector performance on a sustainable basis. Building on the successes of reform in Andhra Pradesh, additional states have embarked with Bank support on reforming their irrigation; these include ongoing projects in Maharashtra, Madhya Pradesh, Rajasthan, and Uttar Pradesh.

In urban water, the focus has been on sectoral reform building on ongoing good examples such as Haryana and Uttar Pradesh. A more pragmatic approach has also been adopted by combining these reforms with activities on the ground as incentives, thus increasing the investment portfolio with innovative approaches such as decentralization.

In hydropower, the reform process has also made progress through the energy agenda. Bank engagement has been consolidated in India with the financing of two major

Identifying key decision-makers and champions is critical to promote important reform agenda, but it is equally crucial to consider the political economy environment and incentives to drive the process forward.

hydropower projects in Rampur (412MW) and Vishnugad Pipalkoti (444MW).

Encouraging progress in promoting the river basin agenda has been noted since 2003. In India, the initial reform in Maharashtra laid the groundwork for river basin institutions with adequate instruments for water regulation and allocation. The pioneering work in Maharashtra has further stimulated other states in championing the basin approach with ongoing work on the Alaknanda River Basin and most recently the establishment of the Ganga National River Basin Authority in February 2009 in India. Additional initiatives have also burgeoned in neighboring riparian countries, with emerging activity on the Indus Basin in Pakistan and river basin work in Nepal. On the international water stage the launch of the South Asia

Water Initiative (SAWI) aimed at supporting riparian countries on both international and national river basin issues is an important step forward. Building on Bank experience in other international basins SAWI stands as a support to countries in implementing a basin management approach.

IFC has also been active in the region, most notably its Clean Tech and Infrastructure investments in Water Health International (WHI), an innovative private distributed services provider that entered the Indian market in 2005. WHI provides an innovative, bottom-of-the-pyramid business solution using low-cost membrane and ultraviolet technology to treat water at the community level for sale at affordable prices to low income consumers who are not connected to a utility water distribution network. IFC provided an early-stage venture capital US\$1.2 million investment. This helped attract more investment from large companies like Dow Chemical and India's ICICI Bank; today WHI sells clean, affordable water in more than 200 Indian communities. Additional IFC financing is backing WHI's new \$32 million expansion, enough to make an impact on the waterborne diseases that claim hundreds of thousands of lives each year in India—more than any other country.

Lessons Learnt

Experience in Andhra Pradesh has shown that actions on the ground tailored with reforms have proven to be strong incentives in fostering the reform agenda. Sustainable institutions and policies are largely driven by internal champions but require pragmatism in sustaining them and consolidating their impact in the long run. Identifying key decision makers and champions is critical to promote important

reform agenda, but it is equally crucial to consider the political environment and incentives to drive the process forward.

Good governance should be measured not only in financing terms (i.e., pricing, cost recovery, and private sector participation), but also by institutional performance, efficiency of regulatory instruments, and policy incentives and enabling environment.

Directions for Future World Bank Group Engagement

The impact of climate change will be further incorporated into the water resources agenda. This will influence both the design and management of water resources development in SAR, especially given that it is one of the most vulnerable regions in the world.

A proposed fourth Andhra Pradesh water sector improvement project will consolidate gains of past projects and focus on: (i) the adoption of a State Water Policy, (ii) ensuring allocation of full annual O&M needs in the budget, (iii) decentralizing irrigation service delivery and system maintenance to WUAs, (iv) adoption of new water management practices/instruments, (v) establishment of a regulatory framework in the water sector, and (vi) restructuring/capacity building of existing Irrigation & CAD Department.

Additional hydropower infrastructure is also in the pipeline in other SAR countries including Pakistan (extension of Tarbela IV—4960 MW) and Nepal (Kali Gandaki rehabilitation—144 MW).

4. Nigeria

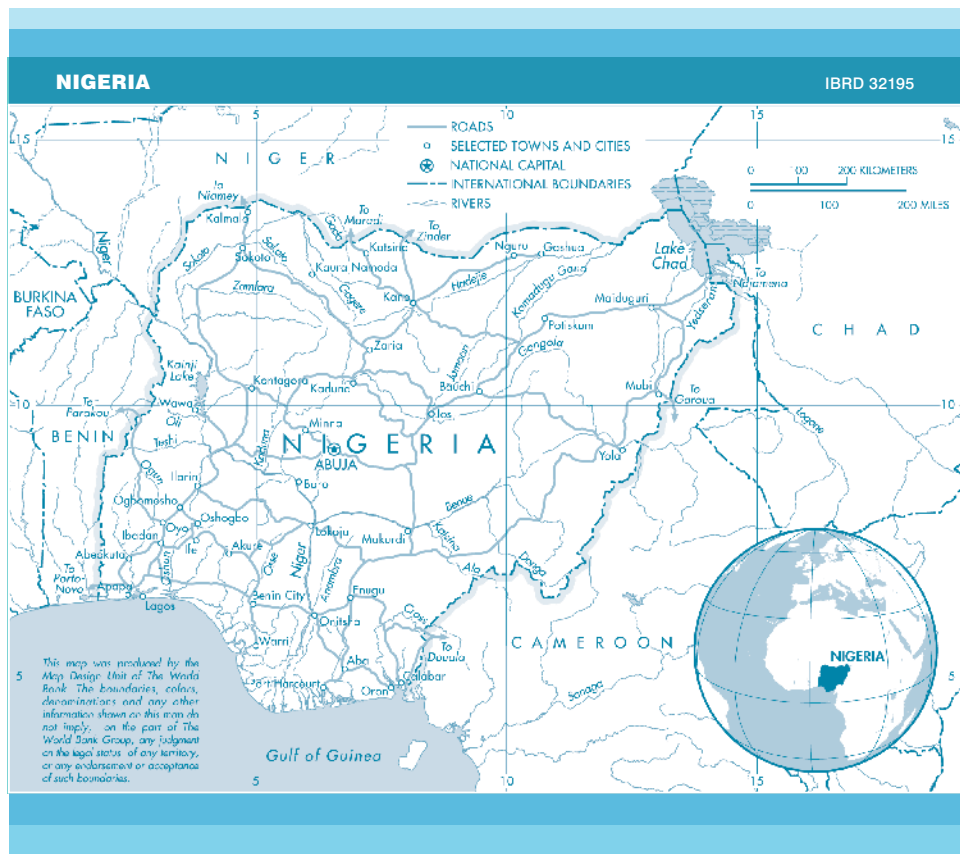
Issues

Poverty remains entrenched in Nigeria, where 70 percent of the rural population

lives below the poverty line. Nigeria is also among the countries with the lowest level of access to water. The political reality of Nigeria poses a major challenge in designing and implementing World Bank activities, especially those involving infrastructure investments. Nigeria presents many institutional limitations and features complex environmental, social, and governance issues. This daunting set of challenges is particularly evident in the water sector, where the most immediate and visible problem is urban water and drainage services in large, rapidly growing cities such as Lagos. Poverty is highest among households in rural areas who work in agriculture. Nigeria possesses low-lying floodplains, known as Fadama, which are fertile land and have easy access to water. But the Fadamas have also been the scene of conflict among farmers, fishers, and pastoralists who are vying for land, water, and grazing resources. Historically, performance of Nigeria's water institutions—agencies for managing urban and rural water supply and sanitation, irrigation, and the domestic and international rivers—have been extremely poor. Despite these extreme challenges, the World Bank's strategy for engagement with Nigeria can be considered best practice under such difficult circumstances.

Proposed Directions for World Bank Engagement in 2003

Given the many complex challenges in Nigeria, the World Bank developed a multi-track engagement strategy consisting of three primary strands: (i) to assist Nigeria in rapidly addressing the most politically visible issues—notably the performance of public utilities—in innovative ways, such as the private management of water services in Lagos,



(ii) to assist in developing a sustainable strategy to address urban and rural sanitation issues by encouraging user-level participation and applying ideas of benchmarking, competition, private sector participation, and accountability; and (iii) laying the groundwork to address long term water management challenges, such as institutional rationalization, legislative reform and development of capacities for strategic water resources management planning. Lastly, the Bank was also expected to play an important facilitating role in international water issues relating to the management of the Niger and Benue Rivers and the Lake Chad Basin.

World Bank Group Achievements in FY03–09

The Bank has been engaged in the reform of the urban water supply sector under two water sector reform projects (for a total of US\$350 million) with a few selected states—Cross River, Kaduna, Enugu, Ogun, and Lagos—while the FCT Water Board is being financed under the NG-Privatization Support Project (US\$25 million). The Urban Water Reform Project is trying to change the way the present system is managed by reviewing and improving water legislation, developing the capacities of utilities to manage water supply systems properly and

to improve their financial performance, and separating the roles and responsibilities for water resource management and water supply provision; these goals which are supported at the federal level.

These two water sector reform projects have also played a critical role in promoting the involvement of the private sector through operator management contracts as part of the investments in rehabilitation of the WTP and distribution networks. Cross River State is leading the way with a private operator managing its water systems, and Kaduna State is following a similar approach with the water treatment operations in Kaduna and Zaria being managed by a private operator. Enugu State Water has also recruited a private operator to manage some of its water operations. The objective of these activities is to improve cost recovery of the water utilities as a way of improving the sustainability of the institutions. Performance targets under each management contract include cost recovery targets, consistent with the Bank's focus on this aspect of water utility management.

The Bank has been working in Lagos State since the 1990s and has developed a close working relationship with the Lagos Water Corporation. The Lagos Water Corporation has started the process of engaging the independent private operators, but given the complexity of the Corporation and the overall political economy of the state, it will take many years of sustained efforts before real reforms can be realized.

The Bank has also provided US \$125.4 million to support the ambitious Second National Fadama Development Project, approved in 2004. The project hoped to increase sustainably the incomes of Fadama users through capacity building, supporting acquisition of productive assets, and developing rural infrastructure across 12 states in Nigeria. The

project also sought to empower communities to take charge of their own development agenda and reduce conflicts among resource users. The participatory component of the project was based on Fadama user groups with common economic interests, such as farmers, fishers, pastoralists (people who raise livestock), women, the disabled, and students. The project encouraged these groups to develop plans, and then each group requested money to pay for income-generating community-level assets, such as fishing nets, fertilizer, water-pumps, or generators. This led to a 590 percent increase in the value of group-owned productive assets. Fadama II also supported off-farm activities such as agroprocessing, business training, and rural marketing. While the project's objectives were to improve the welfare of the citizens in the region, it also contributed to a secondary objective of sustainable community management of water resources, in a region that often faces water conflicts that could result in water stress and shortages among competing water users.

As the Fadama II project intended, the poor and vulnerable groups saw a greater share of the increase in the value of productive assets. In addition, the distance and travel time to the nearest market and travel costs declined significantly following infrastructure investments. Average household incomes increased by about 60 percent, though these benefits were realized more by middle-income beneficiaries than by the poor. It is expected that incomes of all beneficiaries will continue to rise over time given the acquisition of productive assets, improvement in rural infrastructure, and improvement in capacity building. The project inspired the African Development Bank (ADB) to implement similar projects in six states, raising the total number of Nigerian states benefiting from Fadama from 12 to 18. The ADB

Long term effort is essential to show sustainable impacts. Engagement and partnership with other donor agencies is essential to leverage limited resources towards achieving a common project objective.

projects incorporate funds from the Global Environment Fund to support sustainable land use and water management. The project also inspired the Government of Japan to support social infrastructure (e.g. schools, dispensaries) around Fadama communities to enhance the welfare of the rural people.

Since 2003, the Bank has also focused on improving water resources management of two international basins: the Lake Chad Basin and the Niger River Basin. The GEF-funded Lake Chad Project went to the Board in January 2003 and closed in December 2008. At the Basin level, the major contributions of this project were (i) the institutional assessment of the Lake Chad Basin Commission (LCBC), (ii) the Transboundary Diagnostic Analysis, and (iii) the strategic Action Program. This project also included pilot demonstration project activities, one of which was Komadugu Yobe Basin (KYB) in Nigeria. This pilot resulted in a water charter which

institutionalized sustainable and cooperative management of the shared water resources. The riparian States and Federal Government of Nigeria also established a US\$13 million Trust Fund to finance the KYB-CMP. The CMP's proposed action plans will target identified water problems and institute integrated natural resources management instruments in the region.

The Bank has two ongoing projects in the Niger River Basin. The first, a GEF-funded project expected to close in August 2010, was valuable because it was one of the first projects implemented with all 9 countries of the Niger River Basin. This project provided support for the completion of the Shared Vision Process and was endorsed by the Council of Ministers in 2007. The second, a US\$132 million IDA-funded APL project expected to close in 2013, focuses on the rehabilitation of two major dams in Nigeria: the Kainji and Jeba.

The Bank has also supported agricultural development activities in Nigeria through an active program of analytical work and technical assistance. Analytical works produced in collaboration with the Government of Nigeria include: (i) Getting Agriculture Growing in Nigeria (Sectoral strategy-FY06); (ii) Nigeria Agriculture Public Expenditure Review (FY08); and (iii) Nigeria Rural Finance: Assessment of current programs and options (FY08). When the Avian Flu outbreaks emerged in 2006 in Nigeria, credit for the Fadama Project was reallocated to help provide the first early responses. This early response provided a platform for the government to request credit of US\$50 million to minimize the threat posed by the Avian Flu virus to humans and the poultry industry. Currently, the Bank is providing technical assistance to the Government of Nigeria for the drafting of a national Agricultural

Development strategy. As a result of the various analytical works conducted, the Bank has been invited to join the government agricultural team drafting the development of the 2020 Vision for Nigeria.

Lessons Learnt

The Bank has learnt many valuable lessons in Nigeria relating to the urban water sector. A long term and constant engagement is essential to show sustainable impacts. Engagement and partnership with other donor agencies is essential to leverage limited resources towards achieving a common project objective.

The Fadama project succeeded in raising the value of productive assets of the poorest households, but had a limited impact on improving their income. In the future, consideration of access to affordable rural credit services would be helpful to help the poor access productive assets. Furthermore, additional training can further improve the local capacity to manage productive assets.

Regarding international boundary issues, the establishment of a trust fund for catchment plan management in the Komadugu Yobe (KY) is considered best practice and has been possible due to coordination among partners in the catchment (e.g., UNDP, WB, DFID, WWF). It has been effective to work on both soft aspects (knowledge/institutions building) and hard aspects (investment pilots, rehabilitation of infrastructure, etc) in parallel.

Directions for Future World Bank Group Engagement

The World Bank has been active in all three strands identified in the 2003 Strategy. However some challenges still remain. There are two main lingering challenges: (a) Constitutionally, the provision of water supply

services is the responsibility of the state and local governments. However, this institutional structure does not work in practice; all the three tiers of the Nigerian system of government are involved in the provision of water supply in one way or another, as water supply has significant sociopolitical implications for local politicians. As a result there is a lack of coordination among the three tiers of government, and this has resulted in a lack of reliable data on access to water supply and availability, since there is not one single data source for service access and availability; and (b) The lack of a clear policy and enabling legislation and framework is a major problem facing the development of the sector. The institutional framework is not strong, and most, if not all, of the state water authorities are not fully independent but depend on subsidies from the state government for capital investments as well as operations and maintenance. Even though utilities are supposed to collect revenue from water sales, the amount collected is usually inadequate and does not even cover the operating costs of the treatment plants let alone the entire operating cost of the water utility.

Following the success of Fadama II, the Government of Nigeria is strongly committed to the community-driven development approach, and has requested national coverage in the shape of a Third Fadama project. This was approved by the Board on July 1, 2008, and officially launched on August 24, 2009 in Zamfara State by the Minister of Agriculture and Water Resources. Like its predecessor, the new project is relying on demand-driven investments and empowerment of local community groups and individuals with the aim of improving productivity and land and water quality. It is being implemented in Nigeria's 36 states and the Federal Capital Territory, with IDA support in the amount of US\$250 million.

Looking forward, the Bank will continue its focus on improving utility sustainability through activities aimed at improving cost recovery, while also focusing on improving service availability and sustainability. For the water supply sector, the lessons learnt are that where there is more, strong commitment by the state or the governor, the impact of lending is greatly enhanced; the Bank should continue to support states that take their own initiatives in improving service performance, whether through PPPs and/or greater improvement in management of the sector to the extent that urban water supplies are able to cover the cost for operation and maintenance from sales of water. This would allow the Bank to assess how it can complement and add value to a preexisting commitment to change. In addition, the Bank would also increasingly focus on sanitation as a way to improve health outcomes to complement the investments in water supply.

Regarding international basin initiatives, the portfolio of water resources in the Niger Basin will continue to be implemented through the IDA APL Project. There is no near-term project to follow up work on the Lake Chad basin.

5. Philippines

Issues

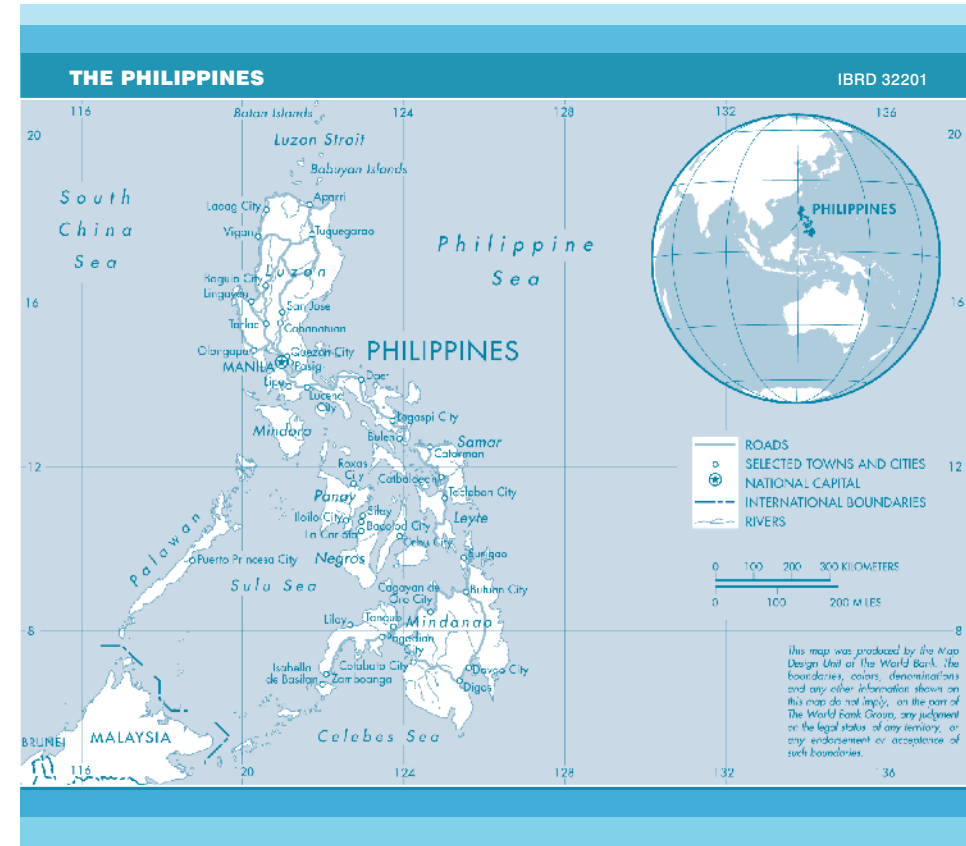
The Philippines have a strong history of water user associations dating back to the 1970s, the success of which has inspired much of the participatory irrigation movement around the world. But there has been little progress in modernizing irrigation management since then. Today, fundamental institutional problems plague the Philippines' water sector, including poor sector planning, weak accountability, and a redundancy

due to its highly fragmented institutional arrangements. This has resulted in under performance, and must be addressed if desired health and poverty impacts are to be achieved.

The Water Resources Board (NWRB) is the lead agency of the Philippine Government responsible for policymaking, regulatory, and quasi-judicial functions of the water sector. The NWRB ensures the optimum exploitation, utilization, development, conservation, and protection of the country's water resources. However, the NWRB has limited capacity to execute these functions because of inadequate financial and technical capacities. The NWRB is currently being downsized and consolidated into the Department of Environment and Natural Resources, a change that could further impair its economic regulatory functions and create a vacuum in the regulation of the sector.

There is also need improve and expand urban water service by strengthening service provider capacity, establishing an enabling environment that provides incentives for good performance and facilitating access to investment financing. Sanitation, a long neglected sector, presents an increasingly complex challenge to address both supply-and demand-side constraints to sector development within a compressed timetable.

Surface water is still the main source of water for urban water supply, meeting 60 percent of the total demand in the Philippines. However, the quality and availability of surface water is under threat due to catchment degradation and pollution, making the investment cost of treatment and operation extremely high. Groundwater is increasingly becoming a major source of drinking water. It currently accounts for 40 percent of demand in the country and this will further increase due to rapid urbanization. Based on the water rights granted by the National Water



Resources Board (NWRB) since 2002, 49 percent of groundwater is consumed by the domestic sector, and the remaining shared by agriculture (32 percent), industry (15 percent), and other sectors (4 percent). About 60 percent of the groundwater extraction is without water-right permits, resulting in indiscriminate withdrawal. A recent study shows that groundwater resources in Manila and other metropolitan cities are being rapidly depleted, resulting in subsidence, salt water intrusion, and contamination from sewage and industrial pollutants. While agriculture only accounts for 32 percent of groundwater consumption, irrigation is the largest user of water from all sources accounting for 80 percent of total use.

Proposed Directions for Bank Engagement in 2003

The 2003 Country Water Resource Assistance Strategy identified the need to support and reform the National Irrigation Association (NIA) in closing the gap between the irrigable service area and the actual area irrigated, recommending that irrigation management transfer to Irrigators' Associations be pursued more deliberately. This was to be accomplished both working from the top, by enabling legislation, and from the bottom, by supporting local efforts where there is strong demand for reform.

World Bank Group Achievements in FY03–09

The Philippine Clean Water Act of 2004 aims to protect the country's water bodies from pollution from land-based sources—industries and commercial establishments, agriculture and community/household activities. It provides a comprehensive and integrated strategy to prevent and minimize pollution through a multi-sectoral and participatory approach involving relevant stakeholders. Based on estimates, the Government needs PhP25 billion per year for ten years for the construction of physical infrastructure required by the Act. However, key national agencies and local governments are faced with multiple challenges in fully implementing the provisions of this law.

Through its Water and Sanitation Program, the Bank has been supporting the Department of Environment and Natural Resources to implement the Act through the establishment of Water Quality Management Areas (WQMA) in Silway River and Sarangani Bay in Southern Philippines. A WQMA is a contiguous area that has similar geologic, hydrologic and physiographic characteristics and which drains to a water body like the river, lake and bays that may cover one or more local government jurisdictions. Under the law, a WQMA Action Plan must be prepared setting (i) goals and targets for sewerage; (ii) a schedule of compliance to meet the applicable requirements; (iii) water pollution control strategies or techniques; (iv) water quality information and education programs; (v) resource requirements and possible sources; (vi) enforcement procedures; and (vii) rewards and incentives. The Act also provides for the establishment of a Water Quality Management Fund (WQMF), which envisions national government to set

aside some funds to support sewerage and septage management programs. To date, the fund has not been resourced and local governments are running out of time to comply with the 2009 targets.

The Bank-assisted Laguna de Bay Institutional Strengthening and Community Participation (LISCOP) Project, which commenced in 2004, attempted to address water pollution and watershed degradation in Laguna Lake and its watershed through reforms and modernization of the regulatory, planning and economic instruments of the Laguna Lake Development Authority (LLDA). The implementation of environmental sub-projects such as solid waste management, wastewater treatment, environmental enhancement/ecotourism and local flood control by the local government units using ecosystem-based and community and participatory approach has improved the water quality of the lake. The implementation of the environmental user fee system (EUFS) for industrial discharges to complement regulations has been responsible for the significant reduction in industrial biochemical oxygen demand (BOD) loading. Industrial BOD loading was reduced from 40 percent in 1996 to only 11 percent in 2006 despite an increase in the number of firms. Scaling up of lessons learned from LISCOP can be used to help cleaning up the water quality in other watershed areas of the country.

In the irrigation sector, Bank work since 2003 has largely focused on institutional strengthening and infrastructure repair and rehabilitation, rather than new construction. This includes building capacity for irrigation associations, introducing new cost recovery policies and self-sustaining systems for O&M; and restructuring of the NIA. During two recent Bank-supported projects, the Second Irrigation Operations

Support Project and the Water Resources Development Project, the NIA piloted the Irrigation Management Transfer scheme with some success, with 12 percent of all NISs now covered. However, the rollout of the IMT scheme to more NISs was stalled by NIA's field personnel who would stand to lose their jobs. The recently approved Participatory Irrigation Development Project, or PIDP, will be a unique opportunity for NIA to pursue this reform in conjunction with its approved Rationalization Plan, which is the main measure authorizing NIA to reorganize and downscale their operating units through an incentive package for early retirement of affected staff. The reforms envisioned in the irrigation sector in the 2003 Country Strategy are all embodied in the PIDP.

In urban water services, the Bank is currently addressing domestic wastewater under the Manila Third Sewerage Project (MTSP). It has committed to further support the concessionaires in the accelerated investment program to address domestic wastewater in response to the Supreme Court ruling to clean-up the Manila Bay. While the transformation on the resource management succeeded in the Angat Dam, the main source of bulk water for Manila and about 30,000 hectares of irrigation facilities, the development of other prospective sources (i.e. Liban Dam and Laguna de Bay) to meet the increasing demand for potable water remains a challenge.

The Bank also attempted to re-engage with Local Water Utilities Administration (LWUA) to help them reform under the Executive Order 279 and support less credit-worthy water districts' improve their service delivery performance in order to graduate them to the commercial market, but were unsuccessful due to management's resistance

to the recommended reforms. While policies are there to support partnership with the private sector, studies have shown that for the partnership to be mutually beneficial and productive, a robust and credible regulatory regime should be in place.

In April 2008 the Bank conducted a scoping mission to do initial assessment of the risks of global warming on the groundwater and its impact on water utilities. Given that small towns and cities account for the bulk of urban population growth, and the effects of climate change—such as lowering or depletion of the groundwater table, seawater intrusion, and land subsidence—should be mitigated, there is a need to expand the assessment of groundwater nationwide and come up with a groundwater management plan that outlines appropriate actions and strategies suitable in different parts of the country.

Responding to a near-crisis situation, the Philippine government privatized Metropolitan Waterworks and Sewage System, the state-owned utility in 1997. A 25-year concession contract was awarded to Manila Water Company, a private water and wastewater concessionaire. Today, with IFC's help, Manila Water has transformed the public utility into a world-class provider—showing that water privatization can succeed economically and deliver for the poor. IFC acted as transaction adviser in structuring the concession and provided a \$15 million investment in equity. It granted three \$30 million loans to help finance infrastructure rehabilitation, expanding water, sewerage, and sanitation services to Manila's low-income areas. In addition, it brokered a relationship with a local micro-finance institution and helped develop a sustainability strategy and sustainability report, and contributed to company's corporate governance manual.

With solid operational and financial performance, Manila Water expands service to an additional 100,000 people in low-income neighborhoods every year. It also works with partners to protect watersheds vital to the city's water supply. Since its contract began in 1997, Manila Water has achieved significant improvements in water quality and availability, with a particular emphasis on service to poorer areas. The company has almost doubled service coverage (from 325,000 to 600,000 households) and the volume of water running through its distribution network (from 440 million to 864 million liters). Water loss is down from 63 percent to a record low of 35 percent. Manila Water accomplished these improvements in a cost-effective manner that has earned it growing profits every year since 1999. The company successfully launched an IPO in 2005, raising an additional \$65 million to invest in the continuing rehabilitation and expansion of the water infrastructure.

Lessons Learnt

Based on implementation experience since the Strategy, lessons have been learnt both about the process and political economy of reform as well as on technical sector issues. First, reforms must include appropriate incentives. This was demonstrated during the restructuring of the NIA when opposition from employees was sufficient to hold up the process; retirement packages had to be offered to the affected staff to ease the transition. Second, while end-user participation is critical, absence of a properly functioning apex regulatory body will further increase the fragmentation in the sector. As institutional issues have become one of the obstacles in the management of water resources, an apex regulatory body

can subsume the interim functions of several regulatory units and come up with a framework towards integrating management of water resources in the country. Finally, the Bank has an opportunity to demonstrate an integrated water quality management approach to cleaning watershed areas in the Manila Bay-Pasig River-Laguna Lake Basin, especially given the momentum from the recent Supreme Court ruling to clean-up the Manila Bay.

Directions for Future World Bank Group Engagement

PIDP is scheduled to be implemented from October 2009 to March 2015, and will contribute to the government's objectives of increased agricultural productivity and enhanced food security, through its focus on irrigation sector restructuring and reform and rehabilitation and modernization of existing irrigation systems.

The Philippine Government recognizes the importance of private sector participation in the provision of public infrastructure, particularly in the water sector where huge capital investments are required. The Bank has supported this approach through the recently closed LGU Urban Water and Sanitation Project, which piloted public-private sector participation (PPP) such as the design-build-lease (DBL) contracts in small towns, concession contracts, management contracts, and even organized providers towards sustainable community-based systems. Currently, private commercial banks and donor agencies are participating in successor projects such as Water Revolving Fund of JBIC and USAID.

With the increasing demand for the provision of safe and potable water to the urban and rural population, irrigation, and other

uses, a detailed knowledge of groundwater and surface water resources is essential. An assessment of water resources to be applied as a tool for water use regulations is critical in urban areas, with due consideration of the effects of climate change.

6. Yemen

Issues

Yemen faces major issues in the water sector: groundwater is rapidly dwindling as a result of overdraft for agriculture, both urban and rural water coverage have barely kept pace with population growth, and flood hazards are increasing.

Yemen's water availability is only 130 m³/capita/year, which is among the lowest in the world. A majority of the Yemeni population lives in the highland areas and relies upon groundwater with relatively low recharge rates. Over the last twenty years, this limited resource has been depleting rapidly because of rapid expansion of groundwater-irrigated agriculture, which has escalated after the introduction of drilling rigs and energized pumps, and the rising competing demands from irrigation and urban users in areas close to large urban centers.

The use of groundwater for *qat* production has been a particularly significant feature in the highland areas of the country. This revolution has brought some prosperity to rural areas in terms of growth in agricultural incomes. However, large parts of the rural economy could disappear within a generation as groundwater is being pumped at an average rate approximately one and a half times that of natural recharge. What is more, urban centers continue to experience shortages in water supply and coverage of adequate water service continues to remain limited.

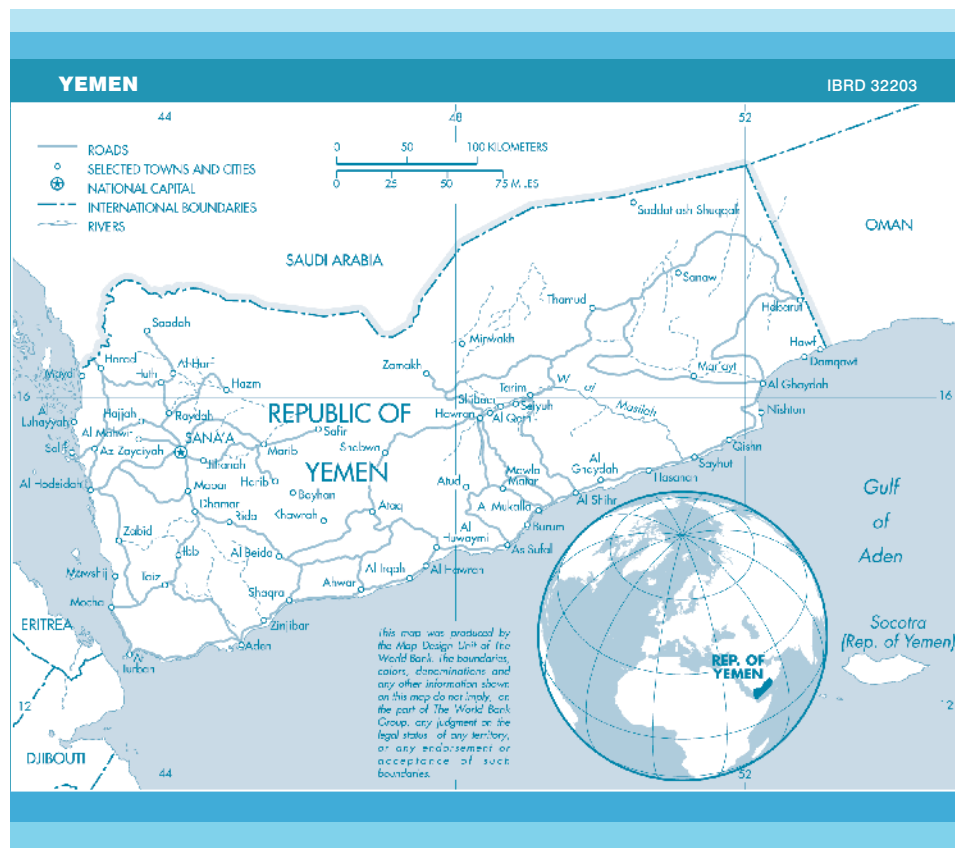
While groundwater in the highlands is a non-renewable over-utilized resource, spate water (flash floods) in the coastal areas is exactly the opposite: renewable yet under-utilized. Much of the spate water is lost to the sea or to the desert fringes, and could be diverted or harvested through low-cost solutions.

Proposed Directions for World Bank Engagement in 2003

Prior to 2003, Bank projects in Yemen generally focused on building water supply infrastructure rather than addressing the fundamental issue of water resource management. The 2003 Water Resource Sector Strategy outlined four key strategies focusing on water resources management: (i) improving the efficiency of water use in agriculture, focusing particularly on reducing real losses (i.e., water lost through evapotranspiration) rather than paper losses (i.e., water that percolates down into the aquifer); (ii) reinforcing strong, traditional, community-based management systems for managing flash flood flows in the coastal rivers; (iii) improving the efficiency of urban water supply; and (iv) starting to address the enormous task of sustainable management of selected aquifers. It also reinforced that when effective management instruments are few, as is the case in Yemen, even greater modesty, patience and persistence are required.

World Bank Group Achievements in FY03-09

The Government of Yemen has undertaken significant restructuring to support better management of water resources and its related services. In 2003, the Ministry of Water and Environment (MWE) was created to oversee three national-level agencies—



NWRA for water resources management, the General Authority for Rural Water and Sanitation Projects (GARWSP) for rural water supply, and the National Water and Sanitation Agency (NWSA)—as well as the 14 newly decentralized and autonomous water and wastewater utilities. As a result of the 2003 strategy, a Country Water Resources Assistance Strategy (CWRAS) was prepared in 2005. The CWRAS was a main catalyst for the government of Yemen to develop its own National Water Sector Strategy and Investment Program (NWSSIP) also in 2005. NWSSIP is now regarded as one of the most comprehensive water plans in the Arab world. It defines objectives, policies,

and approaches for the medium and long term, defines action plans with short and medium-term horizons, and also includes a medium-term investment program. In the water supply sector, fourteen autonomous Local Corporations have been created with a major investment program for rehabilitation and plans for the expansion of services covering more than 90 percent of the urban population. The rural water institution has been restructured, and a rural water sub-sector strategy has been prepared.

Since 2003, there have been five water-related operations ongoing in Yemen. The projects described below have strived to (i) better address the integrated manage-

ment of land and water through watershed management or IWRM components, (ii) give further attention to maximum return per unit of evapotranspiration, (iii) support the development of local capacity to improve the legal and institutional framework and (iv) selectively improve the capacity of national agencies such as the National Water Resources Authority (NWRA) especially in IT and decision-support systems, in parallel to supporting decentralization and community participation.

Given the scarcity of water in Yemen, the Bank has engaged in a mixture of urban and rural supply projects, as well as irrigation projects. A major urban water supply and sanitation project was approved in fiscal year FY03 to (i) support the rehabilitation and expansion of water supply and sanitation services in five main urban areas (Sana'a, Hodeidah, Taiz, Mukallah and Ibb), (ii) support local water corporations to become financially viable, and (iii) create opportunities for increased private-sector participation. This coincides with an ongoing rural water supply and sanitation project which was active 2002–2007, and, upon completion, received a US\$20 million grant to help bridge the gap between project closure and the start of a Water Sector Support Project (WSSP) in 2009. These additional funds would finance activities under the three components of the original project and scale up the achievement of the MDGs in the project's areas of intervention.

The five-year Sana'a Basin Water Management Project became effective January 2004 with the objectives of assisting Yemen in: (i) managing groundwater conflicts between urban and rural usage in the Sana'a basin in a sustainable manner; (ii) increasing the efficiency of agricultural water use within the Sana'a Basin; and (iii)

accelerating aquifer recharge to allow for a gradual shift to a less water-based rural economy. These objectives are designed to be attained through demand management and irrigation improvement, supply management and recharge improvement, institutional development and capacity building, information and public awareness, and environmental management programs.

Irrigation has also been a focus of Bank activity. A groundwater and soil conservation project, which became effective August 2004, was undertaken with the objective to conserve water in farming areas, especially groundwater, and to improve recharge and protect watersheds by: (i) improving water use efficiency and increasing farmer returns to water, creating the conditions that would allow farmers to reduce pumping of groundwater from aquifers towards sustainable levels; (ii) increasing surface and groundwater availability through watershed management and groundwater recharge by supporting the rehabilitation of small to medium spate irrigation schemes, bank protection works, water harvesting structures, and the rehabilitation of terraces and other soil and water conservation investments; and (iii) supporting a groundwater management framework and institutions that will have the incentive and capacity to manage local water resources in a sustainable manner. This project was extended to 2011 and received supplemental financing of approximately to continue the successful implementation of the project over a larger area. Another irrigation improvement project, started in late 2000, recently closed after two extensions. Its objective was to ensure sustainable water resources management in the main spate irrigation schemes in Yemen, contributing to improved agriculture productivity and smallholder income in these

areas. To achieve this, two spate-reliant schemes in western and southern Yemen were rehabilitated and improved, intensive agriculture demonstration programs implemented, and institutional changes (namely Participatory Irrigation Management) introduced. Recently, flash floods in Hadarmoot have caused major damage and claimed human lives. The Bank responded by developing an emergency flood control project (under OP8.0).

Lessons Learnt

In Yemen there are few issues relating to major water infrastructure, but many issues relating to minor infrastructure and the political economy of integrated water resource management.

One lesson is to be realistic about what change is possible and in what time frame. When effective integrated water resource management instruments are few as in Yemen, greater patience and persistence are required.

Another lesson is the need to shift policy dialogue from project investment and the support of large parastatal organizations to the use of institutional and economic instruments that align incentives of service providers with the users of water in both rural and urban areas. In this area, significant progress has been made since the adoption of the 2003 WRM strategy.

Large agencies such as the NWRA have not been able to fully fulfill their mandates and must reorient their objectives to achievable targets given their limited institutional capabilities. Decentralization and increased community involvement have shown to be important in all stages of donor projects. By contrast, the informal private sector has been playing a significant role, mostly in urban water supply. There is still much that

can, and should, be done to organize and harness this potential in both irrigation and urban water services.

Directions for Future World Bank Group Engagement

A Water Sector Support Project (WSSP) was approved in February 2009. In addition to a \$90 million commitment from the World Bank, the project draws co-financing from IDA, Germany, and the Netherlands totaling US\$340 million. It will support Yemen's implementation of the National Water Sector Strategy and Investment Program (NWSSIP) by: (i) strengthening institutions for sustainable water resources management; (ii) improving community-based water resource management; (iii) increasing access to water supply and sanitation services; (iv) increasing returns to water use in agriculture; and (v) stabilizing and reducing groundwater abstraction for agricultural use in critical water basins. The Project is based on fundamental reforms relating to implementation efficiency, coordinated donor harmonization, and improved water sector governance. The project is aligned behind the revised and updated NWSSIP (2008) and implementation is entrusted to mandated national agencies (NWRA, GARWSP, and MAI).

7. The Nile Basin Initiative

Issues

The River Nile is an asset of extraordinary regional and global importance and is shared by 10 countries: Burundi, DR Congo, Egypt, Ethiopia, Eritrea, Kenya, Rwanda, Sudan, Tanzania and Uganda. The Nile Basin is home to more than 300 million people who rely on Nile waters for

basic needs and economic growth. With the potential for both conflict and mutual gain, the Nile remains at the nexus of security and development in the region. Recognizing the potential gains from cooperation, nine Nile riparian states established the NBI in 1999 as an unprecedented regional partnership to develop and manage their shared resources to fight poverty, catalyze economic development and regional integration, and promote stability in the region. At the request of Nile states, the Bank facilitates NBI engagement and development, coordinates partner support, manages the multi-donor trust fund, provides technical assistance, and finances projects. The NBI has been supported by a strong donor partnership, comprising more than 17 bilateral and multilateral partners, ten of which contribute to the World Bank-administered Nile Basin Trust Fund (NBTF). Donors have committed more than US\$250 million to the NBI for capacity building, project preparation and implementation of pre-investment activities.

Proposed Directions for World Bank Engagement in 2003

The principles outlined in the Strategy reinforced the World Bank's mandate to support the work of the NBI, as lead development partner and as administrator of the multi-donor Nile Basin Trust Fund. In particular, the Strategy's recognition that the development of strong water resource management institutions is a long-term process gave the World Bank additional endorsement to support the NBI institution-building activities. Second, the Strategy highlighted the need to pursue development of water infrastructure in parallel with the development of capacity for river basin management: the unique partnership between the NBI and the

development partners has provided the NBI riparians the forum and the resources needed to simultaneously develop investments and build capacity to manage the river basin, using the river basin rather than the state as the planning unit in both endeavors. Finally, the Strategy's call for re-engagement in high-risk high-reward infrastructure enabled the Bank to work with NBI member countries in planning for future high-risk high-reward projects that make sense from a regional perspective, and for which the Bank may eventually provide investment financing.

World Bank Group Achievements in FY03–09

Over the past decade, the NBI has had the unique opportunity to pursue three mutually reinforcing parallel tracks of activity: (i) the development of a transitional regional institution, (ii) the building of management capacity for basin-wide water management, and (iii) the launch of a significant investment portfolio to support water development. With regard to institutional development and managerial capacity building, key outcomes thus far include increased communication, involvement and cooperation among Nile Basin governments and populations; enhanced basin-wide management capabilities based on best practices; and increased convergence of institutional frameworks of Nile Basin countries on transboundary issues. In parallel, Nile cooperation has led to more than US\$1 billion in a first round of investments under the NBI, and an equal amount under other programs that have been enabled by the NBI. Subsequent rounds of investments are focused on more complex joint regional projects.

Since its inception, the NBI has made progress in building a regional institution.

Over the past decade, the NBI has painstakingly built a transitional regional institution, including a Secretariat in Uganda; two sub-basin project development offices in Rwanda and Ethiopia (NELSAP Coordination Unit and Eastern Nile Technical Regional Office, respectively); national offices in each country, and advisory committees and technical working groups. The NBI has formed a network of about 500 national and regional professionals from the NBI, government, non-government and private sectors who are actively engaged in Nile activities and in fostering regional cooperation. Countries have recently concluded “technical negotiations” on the Cooperative Framework Agreement, the first comprehensive treaty on the Nile, which would establish a permanent river basin organization. The one issue to be resolved now rests with the Heads of State.

The NBI has also helped establish capacity for river basin management. A US\$90 million (grant funded) basin-wide capacity building program (the Shared Vision Program) is now near completion, featuring projects in water, environment, agriculture, power trade, applied training, macro-economics, communications, and stakeholder involvement, this program is building the intellectual capital, analytical frameworks and technical foundation to sustainably manage the shared Nile waters. Conceived in 2001 as a capacity and confidence effort, the Shared Vision Program has been restructured to establish the management functions of a river basin organization and to provide an enabling environment for investments. The SVP projects will conclude by the end of 2009, with core activities being absorbed by the NBI or other appropriate institutions in the region.

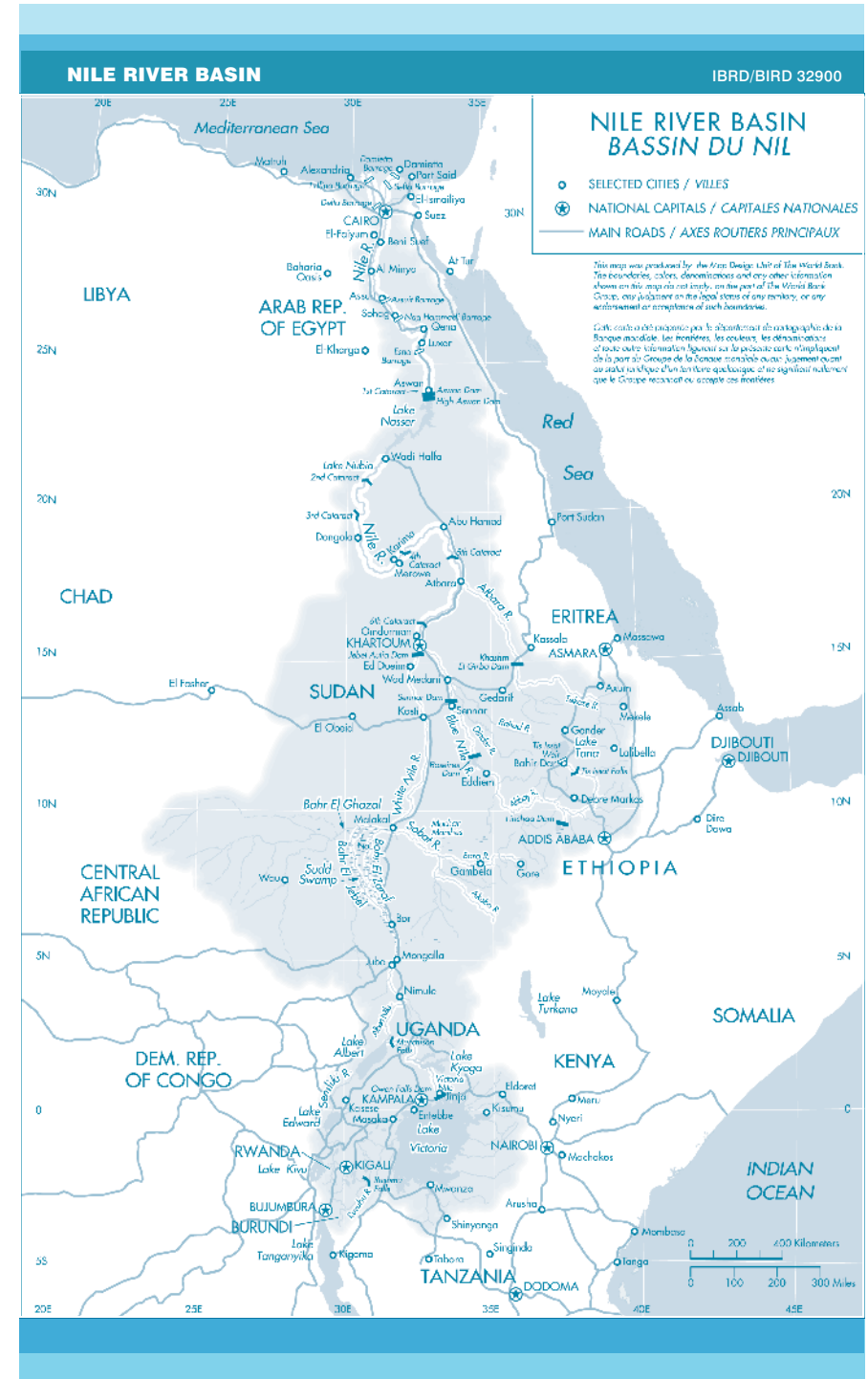
Lastly, the NBI continues to make marked progress in the delivery of its investment programs. Most investment-oriented proj-

ects under the Subsidiary Action Program, agreed at the International Consortium for Cooperation on the Nile in June 2001, are now under implementation or are at advanced stages of preparation. Over US\$725 million of investments in the NBI portfolio are now under implementation, in the areas of irrigation and drainage, watershed management, power trade and flood management, and over US\$375 million are being prepared, in power generation, flood management and modeling. This has provided a solid foundation from which larger, more complex projects and programs are now being identified, including the Eastern Nile First Joint Multipurpose Program and the Equatorial Lakes Power Program. In addition, Nile cooperation has played a key role in facilitating other country and regional projects, such as the Tana Beles Integrated Water Resources Project in Ethiopia and the Eastern African Power Market (EAPM) Program, with US\$185 million in implementation and nearly US\$900 million under preparation. As such, NBI work has yielded approximately US\$1 billion in investment projects under implementation or advanced preparation.

Lessons Learnt

There are several important lessons that have been learned or reaffirmed through the course of the NBI’s twelve years of work. While some of the following lessons were articulated in the Strategy, the importance of the lessons has become more evident through NBI work since the release of the Strategy.

First, local ownership is essential. The Nile riparians have owned, led and staffed the work of the NBI. The World Bank has acted merely as a facilitator, to support the work of the countries in the NBI process. Without commitment from all participating



riparians, the support of the donors would have yielded far fewer results.

Second, undertaking parallel efforts to develop regional institutions, capacity for management, and joint investments was mutually-reinforcing and was critical to the advancement of the NBI. The creation of a transitional regional institution through which these investments could be implemented was a necessary first step in forming a regional river basin organization and to undertake capacity building efforts. Simultaneous activities to increase capacity within the new organizations and at the national level were critical in enhancing the local skill-base. In implementing the investments within the NBI portfolio, NBI affiliates strengthened capacity to manage the resources of the Nile, developed a shared understanding of the possible benefits to be derived from regional cooperation, and increased commitment to the regional institution. All three tracks of activity were designed to be flexible, to allow the countries to adapt their programs to incorporate the lessons learned through the other tracks of activities. Without any one of the three parallel tracks of activities, the impact of the NBI work would have been substantially reduced.

Third, long-term sustained effort and high-level commitment are required to support the parallel efforts referred to above. The efforts of the NBI over the past 12 years would not have been possible without the commitment of top leaders and officials in-country, as well as at development institutions, including the World Bank. In particular, high-risk-high-reward projects require a great deal of preparation, requiring both time and resources. Technical assistance in the early stages of project identification and preparation is critical in reducing the risk profile of

projects, and in enhancing technical, environmental and social aspects of these projects. In the case of the NBI, coordinated donor efforts have enabled the Bank and other development partners to engage early, over a long period of time with the NBI riparians, to identify and to begin to prepare high risk investments, building the capacity of the clients and enhancing the quality of projects being prepared.

Finally, coordination of support from development partners is critical. The seventeen development partners supporting the NBI meet formally twice a year to ensure harmonization of their assistance. While ten of the development partners funnel support through the Nile Basin Trust Fund, the remaining donors are actively engaged and their bi-lateral funding is closely coordinated with the support that is channeled through the multi-donor trust fund. While these coordination efforts take time and resources from all involved parties, the partners have recognized the benefits: partners have requested that the same type of coordination mechanism be put in place for other river basins across Africa before the Nile Basin Trust Fund closes in 2012.

Directions for Future World Bank Group Engagement

In the past year, the NBI has made continued progress in the development of its institutional capacity and delivery of its investment portfolio. The Nile Basin Initiative Secretariat (Nile-SEC), Eastern Nile Technical Regional Office (ENTRO), and NELSAP Coordination Unit (NELSAP-CU) have forged closer executive-and working-level relationships as they begin to jointly create policies, develop NBI strategies on issues like basin sustainability and environmental safeguards, and prepare

investments. A clear example of the latter is the goal of a basin-wide power network spanning both regions. Harmonized policy development is also underway through the NBI-wide Institutional Strengthening Project (NBI-ISP). With the Shared Vision Program (SVP) projects focused on successful completion, this close collaboration will help to ensure that the gains made under the SVP will be sustained throughout NBI operations.

As SVP projects close and Nile investment projects scale-up, the NBI faces the ongoing challenge of aligning national and regional agendas. Linking NBI projects to national priorities is critical to maintaining NBI relevance and ensuring that 'identified' projects are financed. In the past, the NBI has maintained a national presence through SVP activities and national offices. As SVP projects complete this year, Nile countries must assume responsibility for national NBI offices and find new ways to maintain a country presence.

Lastly, the NBI continues to face the challenge of moving from 'implementing projects' to 'behaving as an institution' in an uncertain environment. The NBI is at a critical juncture as it looks to the future and the closure of the NBTF in 2012. Under the NBI-ISP, the NBI has the opportunity to consolidate and institutionalize cooperative gains to-date, complete the first round of capacity building and investments projects, streamline its focus on the 'core business' of a river basin organization, and solidify the financial basis for sustainability. The long-term fate of the Nile cooperation, however, will be influenced by final negotiations on the Cooperative Framework Agreement (CFA). While the Nile Council of Ministers (Nile-COM) has demonstrated leadership this year in advancing these discussions, and all Nile countries express commitment to continued cooperation, the uncertainty around alternative futures presents a clear challenge for the NBI.

Annex B

Monitoring and Evaluation of World Bank Group Support for Water

Inputs and Intermediate Output Indicators	FY03	FY04	FY05	FY06	FY07	FY08	FY09	Total
World Bank Group Commitments in the Water Sectora (US\$ Million)								
World Bank (IBRD, IDA, others)	1,776	2,689	3,633	2,264	4,183	3,445	5,415	23,405
International Finance Corporation	78	125	99	557	559	517	748	2,683
Multilateral Investment Guarantee Agency	0	129	170	47	157	20	75	597
Total	1,854	2,944	3,902	2,867	4,899	3,981	6,238	26,684
World Bank Commitments								
Number of projects approved containing water components	76	80	99	94	133	129	128	739
Volume of projects approved containing water components (US\$ Million)	1,776	2,689	3,633	2,264	4,183	3,445	5,415	23,405
<i>By Sub-sector:</i>								
Water Supply and Sanitation	1,312	1,513	1,956	1,594	2,433	2,073	4,329	15,210
Irrigation & drainage	235	787	1,085	422	912	493	589	4,523
Hydropower	196	282	226	118	387	678	237	2,125
Flood protection	33	108	366	130	450	201	259	1,547
Number of projects approved with WRM Components ^b	23	32	43	32	42	33	33	238
Volume of projects approved with WRM Components ^b (US\$ Million)	213	409	763	274	794	487	971	3,911
Disbursements for projects with water components (US\$ Million)	1,209	1,182	1,237	1,568	1,692	1,798	1,692	10,376
Number of High Risk/High Reward Projects ^c	0	1	1	2	3	1	0	8
Volume of High Risk/High Reward Projects (US\$ Millions) ^c	0	65	125	150	340	400	0	1,080
Number of Development Policy Loans containing water-related sector codes	5	5	9	7	8	11	18	63
Value of Development Policy Loans containing water-related sector codes (US\$ Million)	114	46	94	158	286	430	1,203	2,330
World Bank Non-Lending AAA								
Number of Water ESW Delivered ^d	27	26	34	30	22	23	14	176
Number of Water Non-lending TA Delivered ^d	24	18	37	16	18	17	28	158
Links to CAS and PRSPs								
Number of CWRASs completed	3	6	5	4	1	0	2	21

Annex B

Monitoring and Evaluation of World Bank Group Support for Water

Quality and Output Indicators for Water Projects	FY03	FY04	FY05	FY06	FY07	FY08	FY09	Total
Project performance^f								
Number of Projects	176	178	179	181	198	233	246	-
Net Commitment Amount (US\$ Millions)	12,751	12,875	13,264	13,606	15,889	16,923	19,256	-
Projects at Risk (Percent)	13	15	13	13	15	17	20	-
Commitments at Risk (Percent)	12	14	10	11	14	17	16	-
Realism (Percent)	85	80	75	84	76	64	62	-
Proactivity (Percent)	98	83	87	83	81	83	78	-
Amount Disbursed in Fiscal Year (US\$ Millions)	1,209	1,182	1,237	1,568	1,692	1,798	1,692	-
Rating of completed projects (IEG Evaluation of Water Sector Board Projects)^g								
Number of Projects	18	15	16	12	11	11	-	80
Net Commitments	972	902	655	583	383	550	-	3,894
Outcome (% Satisfactory)	76	87	94	75	91	100	-	86
Sustainability (% likely)	75	86	86	57	100	-	-	79
Institutional development impact (% substantial)	59	67	63	38	100	-	-	60
Net Disconnect	6	0	0	0	0	0	-	1
Process indicators								
World Bank Water Staff (IBRD/IDA) ^h	73	80	87	83	143	151	158	-
Water and Sanitation Program Staff ^h	20	27	27	31	37	56	62	-

^a World Bank figures are based on the Water Anchor Unit's Hydropower Database (which provides greater sector detail than is available in the Business Warehouse) and Business Warehouse. WB figures based on OPCS Sector Codes for water (Water Supply, Sanitation, Sewerage, General Water, Public Administration, Irrigation and Drainage, and Flood Protection). World Bank figures include IBRD, IDA, and others (GEF, Guarantees, Carbon Finance, Special Financing, and Recipient Executed Activities). IFC figures include WSS and Hydropower. MIGA figures include WSS, Waste Management, and Hydropower.

^b Based on OPCS Theme Codes (#85 Water Resources Management).

^c The definition of "high risk" project varies, from category A-type of projects (risk for the environment) to projects that trigger safeguard policies. The Bank has 10 environment, social and legal safeguard policies: OP 4.01 is the umbrella policy for other safeguard policies (OP 4.12 on involuntary resettlement, OP 4.31 on safety of dams, OP 7.50 on international waterways, OP 4.11 on physical and cultural resources, OP 4.04 on natural habitats, OP 4.10 on indigenous people, OP 4.09 on pest management, OP 4.36 on forests, and OP 7.60 on disputed areas). Similarly, the definition of a "high reward" project varies from large infrastructure projects to those that are innovative. Contrary to risk factors (related to safeguards), there are no established "reward" factors. For the purpose of this analysis, factors such as the

economic rate of return, number of beneficiaries, high water commitments, and high commitment of new infrastructure were used. Also, to account for compliance with the Strategy principles, a set of 12 parameters was also used (related to the CAS, water resources management, water quality management, sector reforms, public private partnerships, NGO participation, Cost recovery, financial analysis, poverty related, stakeholder participation, gender, and M&E)

^d Sum of components containing water-related sector codes or water-related theme codes (ie, a non-lending TA project which is 75% WSS and 25% Central Government Administration would be considered three-quarters of one non-lending water activity, rather than one full non-lending water activity.)

^e Annual actual expenditures on AAA activities (direct costs to Bank Budget or annual disbursement from Trust Funds).

^f QAG Portfolio Status Indicators for Water Sector Codes (Water Supply, Sanitation, Sewerage, General Water, Public Administration for Water, Irrigation and Drainage, and Flood Protection) as of 1/14/2009

^g IEG Evaluation Data of Water Sector Board Projects is provided in Business Waterhouse. (Projects ending in FY09 have not yet been evaluated by IEG)

^h Staff includes World Bank (IBRD/IDA) employees, Grade GF and above who are mapped to the Water Sector. These numbers DO NOT include JPO, JPA, SPA, Secondedes, GE and below staff. WSP staff

Annex C

World Bank Group Results Framework for the Water Resources Strategy, FY10–13

OBJECTIVE OF STRATEGY ASSIST CLIENT COUNTRIES TO IMPROVE WATER RESOURCES MANAGEMENT AND DEVELOPMENT FOR SUSTAINABLE GROWTH AND POVERTY REDUCTION					
Strategic Principles	Country-level Indicators	WBG activities and Outputs	WBG Indicators ¹	Baseline FY09	Target FY13
1. Integrated water resource management/ development for sustainable water use and climate change mitigation/ adaptation	<ul style="list-style-type: none"> Number of countries with water resources management plans or a water strategy linking water resources with water services Number of countries with formal planning at the river basin level Water resource management addressed in future climate change discussions/climate change adaptation strategies Share of PRSP that include comprehensive water resource considerations 	Improve/Maintain Water Portfolio Quality/Outcomes	<ul style="list-style-type: none"> Projects at Risk (percent, by sector codes, QAG) Commitments at Risk (percent, by sector codes, QAG) Proactivity (percent)—target: Bank-wide Realism (percent)—target: Bank-wide IEG Outcome Ratings (percent)² 	20	15
		Continued support for integrated approach among sectors at the country level	<ul style="list-style-type: none"> Volume of sector investments with water resource management theme (\$ million).³ Share of “integrated” water projects (percent).⁴ Volume of agriculture projects featuring water resources management (\$ million).⁵ Number of Economic and Sector Work that adopts a comprehensive water framework or includes analysis of several water-using sectors.⁶ 	971	1,500
		Water-Environment (adaptation to climate change)	<ul style="list-style-type: none"> Water is a pillar of the new Environment Strategy Number/volume of water lending that is based on a water resource analysis done by government, Bank or agency.⁷ Number of water projects that address adaptation/climate variability.⁸ Adoption of a screening tool for water projects 	N/A	FY11
		Water-Energy (mitigation to climate change)	<ul style="list-style-type: none"> Water is an element of the new energy strategy Share of hydropower projects that address river basin planning and water use management in planning and design.⁹ 	(*)	(*)
		Water-Social	<ul style="list-style-type: none"> Share of hydropower projects enhancing development benefits to local community programs.¹⁰ Share of water projects with gender-responsive design.¹¹ 	(*)	(*)
		Trans-boundary	<ul style="list-style-type: none"> Number of water projects which address trans-boundary issues during project planning/design.¹² 	N/A	FY11
		Water-Social	<ul style="list-style-type: none"> Share of hydropower projects enhancing development benefits to local community programs.¹⁰ Share of water projects with gender-responsive design.¹¹ 	50	60
			27	50	
			40	50	
			18	25	

Notes: (*) denotes work in progress.

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Strategic Principles	Country-level Indicators	WBG activities and Outputs	WBG Indicators ¹	Baseline FY09	Target FY13	
2. Infrastructure for improved access	Water Supply	■ Number of countries in which access to improved water source increased	Continued support for sustainable water supply	■ Volume of water supply projects (Bank, IFC) (\$million)	WB \$872 IFC \$295	WB \$1,300 IFC \$500
				■ Volume of MIGA guarantees in WSS (MIGA) (\$million)	\$75	\$160
				■ Change in the value of the core indicator for water supply	(*)	(*)
				■ Number of Water Public Expenditure Reviews	8	12
				■ Share of PADs and ICRs of water supply projects that include strengthened financial analysis.	(*)	(*)
Sanitation and wastewater and reuse	■ Number of countries in which access to improved sanitation facilities improved	Improved attention to low-cost onsite sanitation	■ Number of non-lending technical assistance for sanitation	8	12	
			■ Change in the value of each core indicator for sanitation	(*)	(*)	
Irrigation & Drainage	■ Number of countries with improved productivity of cereals (kg/ha)	Increased attention to agricultural water management	■ Volume of irrigation and drainage projects (WBG Agriculture Action Plan implementation) (\$million)	\$600	\$1,000	
Hydropower	■ Percent of the total population with electricity production from hydropower	Increased hydropower projects	■ Change in the value of each core indicator for irrigation and drainage	(*)	(*)	
			■ Volume of hydropower projects (Bank, IFC) (WBG Hydropower Business Plan implementation) (\$ million)	\$428	\$1,000	
3. Build Capacity for Results-Based Decision-making	■ Number of countries making investments in improving hydrological and meteorological monitoring	Better water information in client countries	■ Generation capacity for hydropower installed under WBG projects (Bank, IFC) (MW) ¹³	1,700	2,500	
			Build Bank capacity for results-based project monitoring	■ Number of projects that include financing for monitoring and information systems	(*)	(*)
				■ Advisory services on remote sensing, advanced telemetry and other new sources of data.	N/A	FY11
				■ Integration of basin level data on water into Bank's climate portal	N/A	FY11
Development of core indicators for environment			■ Publication of a Practice Note on Water Accounting	N/A	FY11	
			■ Adoption of core indicators in water supply and sanitation, and irrigation and drainage in projects. ¹⁴	N/A	FY11	
■ Incorporation of water-related indicators in the new environment strategy.						
■ N/A						
■ FY11						

Notes: (*) denotes work in progress.

Endnotes

- 1 IBRD/IDA indicators, unless otherwise noted.
- 2 FY08 Baseline data.
- 3 Projects with water sectors codes that include the water resource management theme.
- 4 Projects with water sector codes which contain at least one thematic code from two of the three relevant thematic groups (Urban Development, Rural Development, and/or Environment and Natural Resource Management).
- 5 Projects with agriculture, fishing, and forestry sector codes and water resources management theme code.
- 6 Examples include country Water Resources Assistance Strategies and Water PERs that include at least two water sector codes.
- 7 Examples include Country Environmental Assessments, Strategic Environmental Assessments, River Basin Planning, Hydrological Analysis.
- 8 Project examples: improved storage, water resource management, preparedness, coastal zone management (based on forthcoming new SAP classification on climate change adaptation and co-benefits).
- 9 Percentage of total portfolio (based on active projects since 2003) for which project planning and design address river basin planning and water use. See Hydropower Business Plan: Sustainability Balanced Scorecard (Annex II), December 2008.
- 10 Percentage of total portfolio (based on active projects since 2003) for which enhancing development benefits to local communities programs has been integrated into project planning, design and implementation. See Hydropower Business Plan: Sustainability Balanced Scorecard (Annex II), December 2008.
- 11 See Making Infrastructure Work for Women and Men (Draft- March), Prepared by SDN.
- 12 Number of projects that trigger OP7.50 on International Waterways.
- 13 Baseline data is average of FY07–FY09.
- 14 Core indicators: water supply (Improved community water points constructed or rehabilitated (number), new piped household water connections (number), piped household water connections affected by rehabilitation works undertaken (number), number of water utilities supported (number), number of other water service providers supported (number)); Sanitation (Number of people trained to improve hygiene behavior or sanitation practices, number of new sewer connections constructed, number of improved latrines constructed; and irrigation and drainage (Area provided with irrigation and drainage services, number of water users provided with irrigation and drainage service, Number of operational water user associations).

Annex D

Outcomes of Selected IDA Water Supply and Sanitation Projects

Urban water projects in Senegal helped usher a reform of the water sector in 1996 which led to increased efficiency and expanded access, particularly for the poor, without increasing water tariffs beyond the rate of inflation. Following the engagement of a private operator in an innovative public-private partnership, water losses decreased from 32 percent to 20 percent between 1998 and 2003. Between 1996 and 2006, access to water supply services was extended to approximately 1.6 million people in Dakar and secondary cities. IDA helped finance 140,000 new household connections at subsidized rates for poor families and 400 public standpipes. Sanitation improved in urban areas with 830,000 people gaining access to sewerage connections or on-site sanitation.

Two successive projects leveraged important funds from other donors and commercial banks and contributed to expanding global access to water to 98 percent of people in Senegal's cities in 2006, up from 74 percent 10 years earlier. The level of household connections in urban areas (76 percent) is now the highest in sub-Saharan Africa. In Ghana, the Second Community Water and Sanitation Program adopted a community-driven approach to water supply, supporting Ghana's decentralization strategy through grants. More than 2,014 communities are now using and managing water and sanitation facilities that they planned and helped build. Overall nearly 800,000 people in four regions (6 percent of Ghana's total rural population) gained access to potable water. The project also provided training to 500 service providers. The Small Towns Water

and Sanitation Project in Uganda succeeded in improving water supply services for over 190,000 people in 11 towns and significantly reduced time spent on water collection.

The Yemen Social Fund for Development provided basic social and economic services to almost 10 million people, of which almost 2 million benefited from access to water supply services. A follow-up project provided more than 820,000 people with improved environmental sanitation.

In the Cambodia Urban Water Supply Project, water losses were reduced from 57 percent in 1998 to 18 percent in 2003, while adding almost 100,000 new connections to the piped network system and resulting in a 34 percent increase in access to improved water sources in the country's urban areas between 1998 and 2004. The increased sales and lower cost of production had a positive impact on the financial performance of the utility. In rural areas of Indonesia, 600,000 households and 3,000 schools have benefited from improved WSS services under the Second Water and Sanitation for Low Income Communities Project.

The on-going Second Community Water Supply and Sanitation Project in Sri Lanka has succeeded in providing so far safe access to water supply to 46,000 households and supported the construction of some 10,000 latrines.