Welcome to Environment matters...

This issue, which serves as our annual review on the environment, looks back on the World Bank’s environmental work from July 2002 through this past June (our fiscal year 2003) and highlights upcoming challenges and opportunities.

The overview article, by Environment Department Director Kristalina Georgieva, reviews progress in the implementation of the Environment Strategy over the last year.

This year we are happy to include articles by such esteemed contributors as Børge Brende, the Norwegian Minister of Environment; Ronnie Kasrils, the South African Minister of Water Affairs and Forestry; Achim Steiner, the Director General of IUCN—The World Conservation Union; and Mark Rosegrant and Joachim von Braun of the International Food Policy Research Institute.

Each of the Bank’s operational Regions has written a review of the Region’s work for the past fiscal year, taking a look at the accomplishments, lessons learned, and future challenges. IFC and WBI have done the same. For operational purposes, the Bank defines the world’s regions as: Africa (AFR), East Asia and Pacific (EAP), Europe and Central Asia (ECA), Latin America and Caribbean (LCR), Middle East and North Africa (MNA), and South Asia (SAR).

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**The World Bank**

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About the Cover

The photo, taken at Nungwi village on the northern tip of Unguja Island in Zanzibar, shows local fishermen preparing for night fishing. Zanzibar is endowed with highly diverse and resource-rich coastal areas that support an array of important natural habitats, including coral reefs, estuaries, lagoons, sea grass beds, coastal forest, and extensive mangrove forests. The poor in these areas depend directly on natural resources for their livelihoods. Coastal marine products (fish, mollusks, shrimps, and crabs) provide a last-resort income-earning opportunity and are the main protein component in the diet of the majority of coastal people. Recently, there has been a significant decline in coastal and marine resources—due in part to unclear property rights, unsustainable fishing practices, unregulated coastal zone development, lack of alternative income-earning opportunities, limited access to markets and social infrastructure, and limited cross-sectoral coordination.

Photographer: Paavo Eliste, Natural Resources Economist, Environment and Social Development Unit, Africa Region, World Bank.
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Letter from the Vice President of Environmentally and Socially Sustainable Development and from the Vice President of Infrastructure

Welcome to the 2003 edition of Environment Matters, dedicated this year to Water and the Environment on the occasion of the 5th World Parks Congress in Durban, South Africa. Environment Matters reviews the World Bank's environmental programs in developing countries and its global engagement. It brings together external and internal viewpoints on the challenges ahead.

During the past century, while the world's population tripled, the aggregate use of water has increased sixfold, with irrigation consuming over 70 percent of available water. These increases have come at high environmental costs: half of the world's wetlands disappeared over the last century, with some rivers now no longer reaching the sea, and 20 percent of freshwater fish now endangered or extinct. If current trends continue, 4 billion people will live under conditions of severe water stress by 2025, particularly in Africa, the Middle East, and South Asia.

It is widely recognized that water is central to the issue of sustainability. Water was the single most important topic identified by decisionmakers at the 2002 World Summit on Sustainable Development (WSSD) in Johannesburg, South Africa. It was the focus of the Meeting of the G8 in Evian, France. Furthermore, the Third World Water Forum held in Kyoto, Japan, in 2003, consolidated a growing consensus on the hurdles to be overcome in order to deliver the Millennium Development Goals.

Financing the water sector will need an additional $100 billion per year over the next 20 years—as established by the report of the World Panel on Financing Water Infrastructure, led by Michel Camdessus. Water financing will require a renewed implementation effort supported by a broad coalition of stakeholders. Water is a basic component underlying responsible economic growth and poverty reduction in poor and middle-income countries. Safe water and proper sanitation help improve human health; more effective water management helps boost growth and provides better protection against droughts and floods, thus reducing the vulnerability of poor people.

Success in meeting the Millennium Development Goals will require strategies that are adapted to the economic, political, and historical conditions of each country. If by 2015 we are to reduce by half the number of people living without access to clean and safe water, management of water resources and services will need to be dramatically improved, including efficient use of water, reduction of pollution, and development and sharing of resources among productive users in all segments of society. There is no one-size-fits-all approach in the water sector, and no one approach should be considered as universal. Fundamental changes in policies and institutions coupled with substantial increases in financing should pave the way for new implementation modalities through multi-stakeholder partnerships among the public sector, private sector, and civil society.

In response to these challenges, the World Bank's Board of Directors has recently endorsed a new Water Resources Strategy as well as a new Infrastructure Action Plan in response to strong client-country demand for infrastructure. The Water Resources Strategy represents a balanced approach that promotes both effective management of water resources and responsible infrastructure development. A key challenge will be to assist countries in developing appropriate stocks of well-performing hydraulic infrastructure. The new Infrastructure Action Plan encompasses innovative ways of financing infrastructure projects, and will apply new and existing instruments more effectively, including a spectrum of public-private partnerships, and project financing at regional, national, and subnational levels.

A sustainable path to development starts and ends with political will and good governance. Decisive action by governments, civil society, and the private sector at the national, regional, and global levels is needed in the coming years to fulfill the commitment endorsed by the international community and steer the water sector away from business-as-usual and toward a path of more environmentally and socially responsible growth.

Nemat Talaat Shafik

Ian Johnson
n September 2002, world leaders stood together in Johannesburg to reaffirm their commitment to eliminating poverty through environmentally sound and socially responsible economic development. They stressed that a healthy environment is central to the international development agenda and an integral part of meeting the Millennium Development Goals (see Box 1, next page). Households must have adequate supplies of uncontaminated water, sanitation facilities, and clean fuels if the goals to combat disease, reduce child mortality, and improve maternal health are to be realized. Reversing land, watershed, and biodiversity degradation is essential for agricultural productivity and reduction of rural poverty, which in turn strengthens the foundations for healthy, educated, and equitable societies. The threat of climate change must be addressed, both through adaptation and mitigation, if all of these goals are to be met and the achievements sustained for future generations.

Achieving the Millennium Development Goals is a tall order. It will require substantial improvements in governance and at least doubling the size of development assistance, currently at about $57 billion a year. The World Bank calculates that achieving Goal 7 may imply up to $35 billion a year in additional aid over the next 15 years. But money alone is not enough to get the job done. New alliances are needed at the local, national, and global levels to allow more equitable sharing of the burden and benefits of development. In addition to increasing aid, rich countries must open their markets further and raise the flow of new technologies to developing countries. Governments in the developing world, in turn, must become more accountable and transparent and ensure that poor people are able to obtain secure land tenure, as well as access to education, health care, and other basic services.

Environmental sustainability at the World Bank

We at the World Bank have developed a comprehensive implementation plan for actions to meet the global commitments stemming from the UN Millennium Declaration and decisions made in Johannesburg, Monterrey, and Doha. We have confirmed envi-
The following eight goals and their targets are to be achieved by 2015, compared to 1990 levels:

1. Eradicate extreme poverty and hunger
   - Halve the proportion of people whose income is less than one dollar a day
   - Halve the proportion of people who suffer from hunger
2. Achieve universal primary education
   - Ensure that boys and girls alike complete primary schooling
3. Promote gender equality and empower women
   - Eliminate gender disparity at all levels of education
4. Reduce child mortality
   - Reduce by two thirds the under-five mortality rate
5. Improve maternal health
   - Reduce by three quarters the maternal mortality ratio
6. Combat HIV/AIDS, malaria and other diseases
   - Reverse the spread of HIV/AIDS and the incidence of malaria and other major diseases
7. Ensure environmental sustainability
   - Integrate sustainable development into country policies and reverse loss of environmental resources
   - Halve the proportion of people without access to safe drinking water
   - Significantly improve the lives of at least 100 million slum dwellers
8. Develop a global partnership for development
   - Raise official development assistance
   - Expand market access
   - Encourage debt sustainability

Currently, active projects with environmental and natural resource management content amount to $13 billion, representing about 13 percent of the total active portfolio of the World Bank. In particular, lending for environmental policies and institutions, a key area emphasized by the Bank's Environment Strategy, is rising sharply. Innovative approaches—like the Mexico Programmatic Structural Adjustment Loan—are supporting the first stage of an outcome-based program to promote sustainable development and mainstream environment in the policies and programs of other sectors. In Brazil, environmental concerns have been mainstreamed into energy and financial-sector adjustment loans. Both in terms of number and quality, non-lending advisory services are also rising. For example, in fiscal 2003 we developed 140 analytical and advisory products in support of the integration of environment in both World Bank and client development strategies and programs. The Strategy emphasizes the role of strategic analyses, including Country Environmental Analysis (CEA) and Strategic Environmental Assessments (SEA). The refinement of methodologies and guidelines for both instruments, as well as their application in the field, has been progressing well, with close to 10 pilot CEAs initiated and 12 SEAs under way.

During this past fiscal year, the Bank has continued improving its application of environmental and social safeguard policies. For example, the new Policy on Disclosure of Information has been successfully implemented. About 83 percent of all new investment lending (in volume) is subject to Category A, B, or FI Environmental Assessment (EA), reflecting the more rigorous application of the EA policy. Improved guidance has been prepared for new lending instruments such as community-driven development projects. Finally, more attention is being paid to supervision of the implementation of safeguard measures in the field and to training and strengthening of client capac-

The Bank's environmental lending has responded positively to the commitments made in the Strategy. After declining for several years, lending for environmental and natural resource management issues is now increasing, reaching $1.1 billion in fiscal 2003, and is projected to grow to $2.1 billion in fiscal 2004 (see Figure, at right).
ity on EA; in fiscal 2003, more than 500 local experts, officials, consultants, and NGO representatives were trained in client countries.

*Integrating environment into poverty reduction strategies and processes.* The Bank is implementing a program to support the adequate incorporation of poverty-environment linkages in Poverty Reduction Strategy Papers (PRSPs), including environmental reviews, training in client countries, selective support to priority PRSPs, and contributing to a Poverty-Environment Partnership with other donors. Specifically, the World Bank has provided, over the last 18 months, targeted environmental input to PRSPs in 13 countries, meeting the Strategy target of 5 to 15 countries per year.

In Yemen, for example, after an initial PRSP that contained little or no mention of environmental issues, the World Bank provided support for a study by local experts on poverty-environment linkages. In the second review of PRSPs, the full PRSP for Yemen was among the top performers. Furthermore, the environment section of the PRSP was used by the government to develop a business plan on sustainable development.

*Enhancing livelihoods by improving natural resources management.* In many developing countries, poor people—especially those living in rural areas—tend to be highly dependent on natural resources for their livelihoods. In many cases, natural resources provide as much as 30 to 40 percent of their income.

The World Bank’s Environment Strategy seeks to enhance the livelihoods of the rural poor on an environmentally sustainable basis. An example is the Mesoamerican Biological Corridor (MBC), a region extending from Southern Mexico

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**2. Links Between Protected Areas and Poverty**

Ensuring that uniquely critical natural areas are effectively protected is a key element of the Bank’s program of support for biodiversity conservation and overall environmental sustainability. Natural habitats and ecosystems reduce human vulnerabilities to natural hazards such as drought and floods, which disproportionately impact the poor. Biological resources provide the raw materials for livelihoods, sustenance, trade, and medicines. Around the world, the Bank is helping to establish new reserves and strengthen management of existing protected areas in 85 countries. Over the past 15 years, the Bank has approved 233 projects with a total portfolio of $3.2 billion in lending, grants, and co-funding. Many of these programs are explicitly linked to sustainable livelihoods and improved resource management for local communities. The India Ecodevelopment Project provides development opportunities to communities to reduce the pressure on national parks. In Indonesia, a national effort to manage and restore coral reefs in the world’s richest marine hotspots includes collaboratively managed marine reserves as the centerpiece of the program. In Bolivia, the Bank is supporting a 15-year program to establish a self-sustaining and decentralized national protected area system managed through partnerships with local and indigenous communities.
to Panama that includes protected areas, buffer zones, and connectors. Through financial and technical support of the $70 million business plan for the MBC, the Bank has been instrumental in widening the focus from primarily biodiversity preservation to a broader, more inclusive focus on sustainable livelihoods, land administration, and regional development.

A more recent initiative is the 10-year Amazon Region Protected Areas (ARPA) program, which was jointly launched by the Government of Brazil, the Bank, the Global Environment Facility (GEF), and the World Wildlife Fund (WWF) during the 2002 Johannesburg summit. In addition to protecting 50 million hectares of Amazon rain forest by implementing existing protected areas and creating and implementing new protected areas, the program will seek greater socioeconomic integration with local society by working in the buffer zone of the protected areas.

 Preventing and reducing environmental health risks. The Bank continues its active support to clients to prevent and reduce environmental health risks. About one-third of the environment and natural resources portfolio is devoted to this issue, with special emphasis on indoor and outdoor air pollution and water supply and sanitation.

On urban air pollution, the Bank has continued its active support, along with several development partners, of the Clean Air Initiatives in East Asia, South Asia, Africa, and Latin America. In all cases, the partnership brings together expertise in urban development, transport, energy reform, environmental management, and environmental health.

Integrating environment into sectors, policies, and institutions. The Strategy stresses the need for supporting policy, regulatory, and institutional reforms and sustainable private-sector development in client countries.

Progress toward mainstreaming environment in sectoral projects, programs, and policies has been generally positive. New analytical instruments, such as the Country Environmental Analysis, are being used to highlight the important links between environment and economic development. The water resources sector is a particular case where the linkages among water supply services, water resources management, and environment are becoming critical in water-stressed and resource-degraded areas. The articles in this issue of Environment Matters look at a variety of these linkages.
WHERE THERE IS A WILL, THERE IS A WAY —
THE PHASEOUT OF OZONE DEPLETING SUBSTANCES

Now in its twelfth year, the Montreal Protocol (MP) Program at the World Bank has assisted more than 30 countries reduce consumption and production of harmful ozone-depleting substances (ODS) by channeling $530 million in grant funding from the MP Multilateral Fund (MLF) and the GEF. Bank MP clients have phased out 41 percent of the 172,755 ozone-depleting potential (ODP) tons of consumption and 95 percent of the 54,563 ODP tons of ODS production that were to be phased out under the entire MLF.

Ending ODS supply while curbing demand is a central focus of the MP Program. Under Bank projects, the three major producers of chlorofluorocarbons (CFCs) in developing countries have drastically reduced production: the Russian Federation stopped CFC production in 2000, India has phased out 75 percent of its production, and China has announced that it will accelerate complete CFC production closure by 2007.

Bank clients have come full circle in their phaseout efforts, from over 500 straightforward investment projects to mature, policy-oriented, national-level strategies focused on the final phaseout of ODS consumption in all sectors. These performance-based programs will provide the foresight and resources needed in the final push toward complete CFC phaseout in 2010.

The environmental sustainability of the private sector is growing in importance, notably in countries where the environmental effects of such growth can affect the quality of life of the population, particularly the poor. The Bank’s private-sector arm, the International Finance Corporation (IFC), has made sustainability a corporate priority. As described in this issue, IFC has established three new facilities—with an estimated funding of $55 million over three years—that will support increased environmental sustainability by the private sector in emerging markets.

Building on synergies between local and global benefits. The Environment Strategy calls for an increased emphasis on the local aspects of global environmental challenges and on reducing the impacts of the degradation of the global environmental commons on developing countries.

Working in partnership with the Global Environment Facility, the Bank has focused on mainstreaming biodiversity in protected areas and beyond into rural development and infrastructure programs; sustainable financing for conservation and sustainable use of biodiversity; development of sustainable renewable energy markets and efficient energy use; and restoration and protection of transboundary water resources and their associated ecosystems. Land degradation and persistent organic pollutants are two new focal areas identified in the October 2002 GEF Assembly. These areas—along with climate change adaptation activities to address the increasing vulnerability of poor countries to the adverse impacts of this change—will become areas of increased Bank-GEF assistance.

Looking ahead

By the middle of this century we can conceivably quadruple the global economy and bring into being a world free of poverty as we know it today—provided that governments, companies, and individuals act to avert a growing risk of severe damage to the environment and profound social unrest. If a leap forward to a better world for all is to be realized, we simply cannot afford current production, consumption, and distribution patterns much longer. Substantial increases in the efficiency of natural resource use, and more inclusive means of decisionmaking, are within our reach, and we must master the will to build a future that puts fewer strains on society and the environment.

For us at the World Bank, the task ahead is to pursue a long-term commitment to our clients on the environmental front, striving for a better understanding of the linkages between environment and structural economic issues, supporting efforts to strengthen the policies and institutions that are indispensable to achieve a sustainable development path, promoting donor alignment for the most efficient use of scarce development resources, and establishing effective ways to mainstream environment in the design and implementation of all our programs.
Ways Forward to Deliver on Our Water Commitments

We don’t realize the value of water until the well is dry, Benjamin Franklin once said. This statement captures in many ways the water development and management challenges we are faced with. The value of water to humans and nature is not properly recognized. The role of water as an engine for growth and the macroeconomic impacts of poor water management and water resources degradation are largely unknown. The world faces an unprecedented water crisis. It is a crisis for people and for nature. Time has come for action—not talk!

At the UN World Summit on Sustainable Development (WSSD) in Johannesburg last year, it was agreed to halve the proportion of people without access to safe drinking water and basic sanitation services by 2015 and to stop the unsustainable exploitation of water resources and to develop integrated water resources management and efficiency plans by 2005. We must take specific initiatives in order to deliver on our commitments from Johannesburg, and we must show tangible results in the most crucial areas in the fight against poverty and environmental degradation.
I have been given a specific task and responsibility to coordinate and spearhead our efforts to achieve the MDGs and WSSD targets as Chairman of the 12th Session of the United Nations Commission on Sustainable Development (CSD). As Chairman for CSD-12, I see the transformation of words into action and focusing on implementation as our main challenge; the international water community has a key role to play in this.

Mobilizing political will from governments at all levels and the international community is a prerequisite for solving the global freshwater crisis. Decisionmakers must now make up for the political inertia of the past and take steps forward to reach the ambitious goals. The UN must take a leading role and the international community must mobilize political will and financial resources. National governments must recognize that participation, transparency, and eliminating corruption is the only way forward to ensure access to clean water and basic sanitation for all.

The water cycle and inherent ecosystems are the life support of the planet, but human activities have caused serious damage to these ecosystems, threatening the health and livelihoods of people who depend on them. The key to good solutions within a basin context is to deal with the underlying problems—poor governance, lack of access, poorly performing utilities, inequitable distribution of water, pollution of water resources, and water scarcity. Solving these problems requires our attention at the local, national, regional, and global levels.

Governments unfortunately do not give water sector issues high priority. Often politicians tend to interfere in the sector, the legal and administrative framework is inadequate, utilities are underperforming, and there is lack of transparency and accountability. Part of the explanation is that water tends to be a local responsibility, and local and national priorities differ. A key challenge will therefore be to mobilize the required political will at lower levels of government and to include all relevant stakeholders in the work.

Reforms in the water sector are of key importance—all countries need to put their own house in order, to improve their water policies and governance. This is part of the global compact agreed to in Monterrey. Developing countries themselves need to assign priorities, draw up strategies, invest in human resources, and implement poverty-oriented policies. Good governance (that is, anti-corruption policies), democracy building, and respect for human rights are crucial to combat poverty and to make development sustainable.

Better governance is essential for improving water management and providing efficient water supply and sanitation services. National- and basin-level water management strategies must give priority to the fight against poverty. The primary responsibility for ensuring equitable and sustainable water management rests with governments, at all levels, in accordance with the principles of integrated water resources management. Countries should make sure that water and sanitation are integrated into development strategies, including poverty reduction schemes, allowing the effective integration of the water and poverty agenda with macroeconomic policies and public finance.

However, we in the international community should be cognizant of the fact that there are many ways of organizing the water sector, reflecting local political, cultural, and administrative traditions. It should be entirely up to the countries themselves to decide how they will organize their water sector. Regardless, a key issue will be to hold the water actors and organizations to account for their performance. There is no one size that fits all!

There is a strong linkage between the state of environment of freshwater resources in a country and its capacity for poverty eradication and development. Conserving freshwater habitats such as lakes, rivers, springs, marshes, and ponds is one of the most efficient and cost-effective means of guaranteeing supply services for safe drinking water. If these ecosystems are not looked after, basic human needs cannot be met and further social and economic development will be retarded.

We marketed the World Summit as a time-shift from words to action. I will—through the CSD—contribute to giving us the power needed to follow our commitments. This will, however, require financial resources. In this respect, donors and international financing institutions, including the World Bank, have
a key responsibility in prioritizing support to the water sector. Official development assistance (ODA) can, however, only be a catalyst. We need to use ODA strategically to catalyze and mobilize capital from domestic markets and develop public-private partnerships to finance the required water infrastructure.

I am, however, confident that the world has the financial resources needed to implement the Johannesburg targets if we can mobilize the political will to do so. We need growth, but it has to be sustainable. Growth is needed to eradicate poverty, the most important threat to human well-being. Unhealthy growth makes it impossible to sustain nature, the most important source of life.

To eradicate poverty and protect our ecosystems and biodiversity, we must use the opportunities nature gives us today in a way that does not reduce our benefits from nature tomorrow. Zero growth cannot be a goal, but zero emissions most certainly can. The challenge is to achieve more growth with less use of land, resources, energy, harmful chemicals, and waste. To decouple economic growth and environmental damage is essential to protect nature. It is also essential in order to eradicate poverty. In short, it is essential to sustainable development. We have the means—if we choose to use them.

Building, maintaining, and operating infrastructure—pipes, treatment works, and connections—to get water to households costs money. There are only two sources of paying for investments—payments by users or payments by taxpayers. Only by charging those who are served can services be extended to the unconnected. Tariff setting must include subsidies to the poor. Subsidies are not free; they come from state budgets. Subsidies waste money regardless of need—money that could have been targeted to give the poor a better life. More sustainable production cannot be realized without adoption of the “polluter pays principle” and the elimination of harmful subsidies.

To a large extent we have the means. Lots of good policies are being implemented both nationally and at the basin level. Still, the remaining challenges are formidable. We as ministers acknowledged this in Johannesburg and made commitments to action both at the national and the international level.

The CSD has the potential to play a crucial role in maintaining the momentum of Johannesburg and to give a strong political impetus to the implementation of the WSSD targets. The CSD is a unique forum in the sense that it is the only global institution focusing on the integration of the three dimensions of sustainable development. I would like to see the CSD keep and further strengthen this focus. The CSD should draw on its strengths and be more focused on policy coherence and the underlying economic and legal framework that can make sustainable development a reality.

CSD-12 will focus on how to reach our common objectives, and it will uphold the political pressure on us to deliver. It will be a scorekeeper, identify obstacles, and provide clear and concise recommendations for further action. The CSD will take advantage of the good work that is being done in other international organizations and the focus will be on implementation of the water-related goals we have agreed on.

We need to forge alliances that can attack poverty and provide water services. And we must bring business, NGOs, and other major groups on board to drive the process forward. In Johannesburg it was an alliance of business, NGOs, and decisionmakers that made it possible to agree on the sanitation target.

I believe that the CSD will be able to fulfill its mandate. My job now is to make the CSD a relevant and effective organization and ensure that the world community is set on the right track toward stopping unsustainable exploration of water resources and providing safe water supply and sanitation for all.

Børge Brende is the Norwegian Minister of the Environment and the Chairman of the 12th Session of the UN Commission on Sustainable Development.
Water gives life. The amount and nature of the available water determines the extent and nature of that life. The amount and nature of water available also determines where development can take place. South Africa's water belongs to its people. It is the task of the South African Government to care for this water, to seek its fair distribution, and to facilitate its wise use.

Two provisions of the Bill of Rights—part of the Constitution passed in 1996—are particularly relevant to the management of water resources. These are sections 27 and 24, which state that:

1. Everyone has the right to have access to (among others) sufficient food and water, and that the State must take reasonable legislative and other measures, within its available resources, to achieve the progressive realization of these rights.

2. Everyone has the right to an environment that is not harmful to their health or well-being; and to have the environment protected, for the benefit of present and future generations, through reasonable legislative and other measures that prevent pollution and ecological degradation; promote conservation; and secure sustainable development and use of natural resources; while promoting justifiable economic and social development.

The Constitution, along with the 1994 Reconstruction and Development Programme (which stressed the importance of citizen participation in decision-making) provided the impetus for a complete review and revision of the policy and law that relates to water and resulted in the development of the National Water Policy for South Africa (1997) and the National Water Act (1998).

Objectives of water management

In South Africa, we have been through a remarkable process of revising our water law. This exercise was driven by two key factors: the demands and dreams of our people in a new democracy and the limited physical resources at our disposal.
We spent a lot of time in consultation, debate, and discussion, and finally agreed that our vision was that “The objective of managing the quantity, quality, and reliability of the nation's water resources is to achieve optimum long-term, environmentally sustainable, social and economic benefit for society from their use.”

This is a simple, but far-reaching understanding—that even in countries where water is plentiful, the protection of the resource from the impacts of human activities requires that we live within our means.

It is for this reason that the National Water Act is premised on three fundamental principles: equity, efficiency, and sustainability. Each of these principles is important for different reasons.

**Equity.** Water is one obvious tool in the eradication of poverty—providing a way for the poorest of people to survive and make a living, a burden that so often rests upon women in society. It is the responsibility of the Department of Water Affairs and Forestry to ensure that we use our water resources wisely in our search for social justice. At the same time, the needs of industry, agriculture, and the demands of cities and of ordinary people all need to be catered for, now and in the future. The National Water Act also requires the government to address the issues of gender inequity in water as much as it must address inequity arising from race or disability. In a country with one of the highest degrees of social inequity anywhere in the world, this is a crucial element of our approach.

**Sustainability.** We have increasingly understood our obligation to protect the natural environment while we promote development so that we can meet not only the needs of current generations but the needs of future generations as well. While most human activities take place on land, these activities often affect the quality and quantity of water.

**Efficiency.** South Africa is a water-scarce country. Our average annual rainfall is a little more than half of the world average, and much of our country is semi-arid. Potential evaporation is higher than rainfall across most of the country. Our land is vulnerable to floods and droughts. Our legislation gives primacy to the protection of aquatic ecosystems and the provision of water for basic human needs. It gives us powerful tools to reallocate water to address issues of over-allocation, resource degradation, or social inequity.

**Water supply and sanitation**

In 1994 an estimated 14 million people in rural areas of South Africa had inadequate access to safe water and some 21 million people did not have access to a basic level of sanitation. Acknowledging that access to water and sanitation was crucial for human well-being and development, the newly elected democratic government faced the challenge and initiated the Community Water Supply and Sanitation Programme. Since its inception, the program has provided 9 million people access to safe, clean water and is expected to eradicate the current backlog of 5 million without a water supply by 2008.

In terms of sanitation, the program is expected to provide basic levels to the 16 million remaining people without adequate access by the year 2010. Our approach has been more than just building toilets. It has recognized that health and hygiene practices and education are critical to the success of the sanitation program.

The program has had a fundamental positive effect in rural areas by reducing the vulnerability of the poor to disasters and improving their capacity to generate sustainable livelihoods. It has already created over 430,000 employment opportunities, with more than 50 percent going to women and approximately 33 percent to young people.

**Government and effective development**

The state is not a fashionable agent in this post-industrial world. More and more emphasis is placed on the role of the private sector. Yet the developed part of the world, which is pushing this position, is characterized by high levels of infrastructure investment that in most cases would not have occurred were it dependent on the whims of the market. For example, on the
eastern seaboard of South Africa, the Komati Basin could support much more economic activity in Swaziland, Mozambique, and South Africa. But the figures show that it could take around 45 years to reap a return on the initial investments needed to tap those waters. There are few private investors willing to wait for that time frame to get a return. So we must depend on the states of the region to take the steps needed to harness unexploited water resources. Countries such as Namibia and Botswana, perceived of as arid (although they in fact have more water per capita than South Africa) are using only 5 to 10 percent of their usable water compared with South Africa’s use, which is approaching 60 percent.

In short, we find that in our region we cannot accept institutional prescriptions appropriate to developed countries, where the role of the state in achieving a mature infrastructure has been played out. In the water resources area, we have come to the conclusion that our challenge is to reinvent government, not to abandon it. We are in the process of establishing 19 Catchment Management Agencies that will enable us to manage water according to watershed boundaries, rather than political boundaries. They are also designed to ensure that stakeholders can play a key role in water management decisions that directly affect them.

Our Proposed National Water Resources Strategy, published in August 2002, sets out the policies, strategies, plans, and procedures by which we aim to achieve integrated water resources management in South Africa. It also provides essential information, for use by all spheres of government and the private sector, for planning developments and initiatives. We have gone through a country-wide public consultation process, including workshops in all 19 water management areas. My department is now in the process of considering the many hundreds of comments it has received on the Proposed Strategy, which will be changed where necessary and then submitted to Cabinet for final approval.

International rivers

Under the new water law of South Africa, the national government is defined as the custodian of the nation’s water resources. But it is recognized that many of these resources serve more than the people of South Africa. Rivers do not respect political boundaries. South Africa shares four major river systems with neighboring countries.

In relation to our neighbors, the law reinforces the approach we have already begun. On a bilateral basis, we are actively committed to cooperation. At the regional level, we have ratified the Protocol on Shared River Courses and we are keen to see the management of water given a higher priority within the regional framework provided by the South African Development Community.

Conclusion

We need to develop visions for water resource management that extend to entire regions. It is vital to achieve equity—and the prosperity that can flow from the best management of a common resource. We should pool our intellectual energy to look toward total basin management, which can transcend national boundaries and ensure the use of water for the common good of all.

We need to apply our intellectual energy to the even greater benefits that could flow from collaboration based on comparative regional advantage through trade in commodities.

In Southern Africa, we are trying hard to ensure that our management of water resources is a source of peace and development, both internally and with our neighbors, just as we would hope to see sustainable development leading to peace and democracy throughout the world.

Ronnie Kasrils is the Minister of Water Affairs and Forestry in South Africa.
Cara Sucia—a small village in El Salvador—means "dirty face." In that little village, fishers are worried. They say that catches of fish and shrimp are dropping. The conversion of the mangroves that nurture young fish and shrimp, the pollution of the water by agricultural runoff, and the reduction in river flows in the basin due to abstraction are directly affecting their livelihoods and economic well-being.

We see similar situations the world over. They reveal the complex patterns of water resource uses and their consequences, where poverty and environmental degradation often lie both at the beginning and at the end of the chain. The poor who live downstream typically suffer the most intense consequences of water quality and quantity being reduced upstream.

The international community has accepted integrated water resources management as the way to deal with the complexities on the ground. It is an approach that encompasses improved governance, environmental protection, water supply and sanitation, and so on. It is based on stakeholder participation. It is also an approach that recognizes the complex linkages among economy, livelihoods, water, and ecological integrity in river basins.

Naturally, the environment and nature in the widest sense are users of water. There is ample evidence to show that—just like dams, irrigation schemes, and domestic consumers—they are economic users of water and economic producers of services. In addition, because ecosystems provide an important range of services that protect water quality and availability, it is becoming increasingly clear that they too should be considered an economic part of water infrastructure and supply. Their interests should therefore be defended at the negotiation table and in the marketplace, as one of the stakeholders in the basin, as a source of water investment and funding, and as a major consumer of water.

But they also deserve a much more profound protection in legal frameworks, given the inextricable link between water and nature. One cannot exist without the other, and one cannot be managed sustainably without the other.

In South Africa, the National Water Act recognized the need to allocate water to a healthy environment and established provisions for environmental flows. Water of sufficient quality and quantity is left in the river to maintain it in a desired state. It is an excellent tool to ensure healthy rivers, share water equitably, and reduce poverty.

For instance, the Lesotho Highlands Water Project proposes several dams on the Senqu River System in Lesotho. Research shows that the 155,000 rural communities downstream catch an average of 22.7 kilograms of fish per household and gather on average 148 plastic bags of wild vegetables and medicinal plants. This may seem negligible in GDP terms, but the market value of these products is $77 per year per household. In a country where over half of the rural population lives below the poverty line, these natural resources are of extreme importance. The application of environmental flows allocations pre-
vented these communities from losing a substantial part of their livelihood.

In that sense, it is important to remark that the debate on water supply often ignores the conception of our forests and wetlands as an integral part of the water infrastructure that delivers water to our homes, farms, and industry. We pay the costs of pipes and pumps, but we do not pay the costs to maintain our natural supply chain: our rivers, wetlands, creeks, ponds, and forests. Investments in water supply and sanitation cannot be limited to drilling wells or installing faucets, but should also extend to the maintenance of ecosystems that, in the end, ensure the provision of water.

Provision of environmental flows is also important for protected areas. In the light of this year's IUCN World Parks Congress, water resources management cannot ignore their legitimate claim to a share of water. The allocation will have a significant return, because protected areas, especially upper watershed forests, are also important for water supply and regulation. This is demonstrated by the increasing investments of water utilities in the management of raw water supplies, such as through land purchase or agreements with farmers to undertake watershed protection for urban areas such as New York City and Quito.

But the need for water for protected areas also poses a challenge to the protected area community. Parks have mostly been established for their biodiversity and landscape values. Now we must also build the case for their importance to the hydrological cycle and their contribution to the Millennium Development Goals. Evidence is growing and, in the future, I can imagine more protected areas will be established solely for their importance to water quantity and quality.

An emphasis on the services of ecosystems almost automatically means that we need to find tools to consider these values in decisionmaking. Economic valuation is one of these tools. Valuations demonstrate, time and time again, that natural habitats deliver an array of services that often exceed those of proposed development options.

The small Muthurajawela Wetland in Sri Lanka represents a total value exceeding $7.5 million per year. The Hadejia-Nguru floodplain in Nigeria provides at least $32 per 1000 cubic meters of water, against $0.04 for a proposed irrigation scheme.

Economic valuation gives us a powerful tool to arrive at different, more rational development decisions. But we need to extend its use if we are to turn environmental protection and nature conservation into a tool for poverty alleviation. Values and uses need to be translated into a system of incentives and transfers that not only pay for maintenance of environmental services but also address the needs of poor communities involved in their management. The challenge is to turn the maintenance of healthy ecosystems into a substantial development option.

Integrated water resources management, or the ecosystem approach to water resources management, has already delivered tangible results in many river basins. Progress is being made, for instance, with the implementation of environmental flows and with innovative financing for water management. The most progressive of these, South Africa, has based its water management on two pillars: environmental protection and meeting basic human needs. Another example is the World Commission on Dams. The process and report alike proved to be major steps forward in multi-stakeholder decisionmaking on one of the most contentious issues in water management, including the WCD’s “rights and risks” approach to provide an honest and balanced assessment of the cost and benefits of dams.

Given such achievements, many environmental experts remain concerned that valuable lessons—on, for instance, governance, equity, poverty alleviation, and environmental protection and management—have not been adequately captured in the World Bank’s Water Resources Sector Strategy approved earlier this year.

For the complex issues in water resource management there is no generic solution. The issues need to be resolved at the basin level by the stakeholders who come together to find integrated solutions that are best for all—in the long run. Despite this lack of a simple answer, the examples are inspirational. They show that, when we recognize the necessity of a healthy environment and the basic needs of the people, we can arrive at water management that is truly sustainable and equitable.

In El Salvador, the fishers of Cara Sucia take part in a roundtable of resource users, set up with support from IUCN almost two years ago, where they discuss the problems in the basin and define joint action to solve them. They may not see their fish catch increase tomorrow, but I am confident that in the future we can add the Barra de Santiago–El Impossible basin to the list of good examples.

Achim Steiner is Director General of IUCN — The World Conservation Union.
Recent research at the International Food Policy Research Institute (IFPRI) indicates that further inattention to water-related investments and policies could lead to a severe water crisis that precipitates a food crisis.

Fortunately, there are alternatives. Policies and investments that promote sustainable water use can contribute to greater water and food security. Water may be a scarce resource, but humans have already developed many ways of using it more efficiently in irrigation and in household and industrial uses.

**Business as usual means growing irrigation water scarcity**

Assuming that current trends in water and food policy, management, and investment continue, IFPRI projects a 22 percent increase in total global water withdrawals between 1995 and 2025. Non-irrigation uses—domestic, industrial, and livestock—will increase dramatically, rising by 62 percent. Rapid population growth, mainly in the cities of the developing world, will drive a 71 percent rise in domestic water consumption, with more than 90 percent of this coming from developing countries. As a result, irrigation water use will rise by only 4 percent, although irrigation water demand will grow 12 percent in all developing countries and 27 percent in Sub-Saharan Africa.

The relative scarcity of irrigation water will mean slower growth of food production. Cereal yield growth rates will fall from 1.5 percent per year over 1982-95 to 1 percent annually between 1995 and 2025. For developing countries, the rates will decline from 1.9 percent to 1.2 percent. The direct contribution of water scarcity to the yield slowdown translates into 130 million metric tons less cereal production each year, equivalent to a year of rice output in China or two years of wheat production in the United States.

However, rising incomes and brisk urbanization in developing countries will account for most of the 47 percent growth in cereal demand over 1995-2025. The resulting growth in meat and dairy consumption will mean strong growth in demand for maize for animal feed.

Given the gap between domestic grain production and demand, developing countries will more than double their imports between 1995 and 2025. These “virtual water imports,” which substitute food imports for irrigated agricultural production, offer developing countries one means of conserving water. However, it is unlikely that Sub-Saharan Africa will be able to finance a projected threefold jump in cereal imports on commercial terms, so it will require financial or food aid.

**Water crisis scenario**

Even a moderate worsening of current trends could spur a genuine water crisis. In such a scenario, governments further
cut their spending on irrigation systems and rapidly turn over irrigation systems to farmers and farmer groups without the necessary reforms in water rights. Governments and donors reduce investments in crop breeding for rainfed agriculture in developing countries. This would result in an additional 13 percent increase in water consumption in 2025, almost entirely for irrigation, and much of this water will be wasted. Farmers will extract increasing amounts of groundwater and environmental flows, causing failure of key aquifers and compromising aquatic ecosystems.

Given the inefficiency of water use in this scenario, cereal production will decline by a further 10 percent over the business-as-usual shortfall, equivalent to the entire Indian cereal crop. Grain prices will rise dramatically, causing a 23 percent fall in developing-country imports from the business-as-usual scenario. Per capita cereal consumption in developing countries in 2025 will drop below 1995 levels, meaning an increase in food insecurity.

**Sustainable water use**

In a sustainable water use scenario, governments and donors increase investments in crop research, technological change, and reform of water management to boost water productivity and the growth of rainfed yields. Improved policies and increased investment in rural infrastructure will help link remote farmers to markets and reduce the risks of rainfed farming. If reduced investments in irrigation and water supply were combined with growth in rainfed cereal production and increased harvesting of rainwater, this would mean 153 million metric tons less irrigated output, but 187 million tons more rainfed production. This requires crop breeding targeted to rainfed environments, agricultural extension services, and access to markets, credit, and input supplies in rainfed areas.

Halting unsustainable groundwater pumping in China, India, and the Middle East will reduce developing-country cereal production and necessitate imports. Efforts to restore sustainable groundwater supplies must be accompanied by policies to increase the efficiency of water use, to encourage diversification of production beyond irrigated cereal cultivation into crops that give more value per unit of water, and to boost the nonfarm rural economy in overdrafting regions.

To stimulate water conservation, the effective price of irrigation water will need to gradually increase. Governments in many regions will have to shift water rights and management responsibilities to users and offer them training and support. This will stimulate increased farmer investments in water-saving technologies. Higher prices for (and stricter regulation of) domestic and industrial water use can likewise lead to greater efficiency. Industrial water recycling can be a major source of water savings, and domestic use can be made more efficient through improved maintenance of municipal systems. Higher water prices must be accompanied by targeted subsidies to ensure that poor urban consumers have access, and by compensation to farmers for reduced water consumption. Even with such policies, raising water prices is politically difficult, given the range of actors with vested interests in maintaining the status quo. Some of the reduced water consumption that results from these measures can be allocated to environmental uses. In order to maintain adequate food production, more efficient water use can be achieved through technologies such as drip irrigation (which also has the health benefit of reducing malaria mosquito habitat) and precision agriculture and through management changes such as adoption of demand-based irrigation scheduling systems.

The sustainable water scenario results in 20 percent less water consumption than under business as usual, but developing countries reap greater benefits. Water savings left instream for environmental purposes will be triple the annual levels of the Mississippi River. Faster growth in rainfed yields will compensate for declining growth of harvests in irrigated areas, boosting global cereal production in 2025 by 1 percent over harvests in the business-as-usual scenario.

The strategies outlined in the sustainable water scenario can avert the impending water crisis that much of the world faces, but they will require time, political commitment, and money. To succeed, implementation of these strategies must begin now.
The Bank’s New Water Resources Strategy

The Bank’s Lending Commitment for Water

Water has been a large component of Bank lending for decades. Lending for water resources development and water-related services accounted for about 16 percent of all Bank lending over the past decade. Historically, the World Bank Group has invested about $3 billion a year in water-related sectors, accounting for about 5 percent of investment in developing countries.

Two challenges

In brief, developing countries need both better management and development of infrastructure.

First, all countries face major challenges in developing the laws, regulations, and institutions to manage water resources in ways that are economically productive, socially acceptable, and environmentally sustainable. Better resource and demand management therefore has a high priority for the World Bank and many of its borrowers. These countries need to invest heavily in non-structural management solutions. Such efforts range from the massive efforts at watershed management in the Upper Yangtze catchment in China to the development of improved hydrology data in India and elimination of water-using invasive plants in South Africa. World Bank investments in non-structural solutions are increasing rapidly. For example, Bank investments in watershed management are projected to reach about $300 million a year in the next few years.

Second, all countries face a major challenge in developing and maintaining an appropriate stock of water infrastructure. Industrial countries have largely completed these investments, but the developing countries have not. For example, Australia and Ethiopia have similar degrees of climatic variability, but Australia has
5,000 cubic meters of water storage capacity per person, while Ethiopia has 45 cubic meters. Developing countries must simultaneously improve the way in which water and water services are managed and invest in developing priority infrastructure.

**Principled and pragmatic reforms**

The Strategy reaffirms the importance of basic economic principles. Sound resource management requires that users take into account both the financial costs of supplying services and the costs that their use of water imposes on others for whom water is no longer available ("opportunity costs").

**Financial costs.** Water supply services have traditionally been underpriced, resulting in inefficiency (and an inability to attract new investment) and inequity (since the poor are often excluded). Pricing to cover financial costs is essential for three reasons. First, it provides the user with information on the cost of providing the service, inducing more considerate use than if it were free. Second, revenues from tariffs are the basis for maintaining existing and building new infrastructure. Third, payments for services are essential in ensuring that providers are accountable to users.

**Opportunity costs.** When one person consumes water, other potential users may be denied the opportunity and value of such use. In ensuring that water is allocated and used efficiently, it is essential that there be institutional arrangements for ensuring that these "opportunity costs" are taken into account. Where water is scarce the central challenge is the development of a legal and enforceable system of water rights. Once established, such rights give rise to a series of fundamental and healthy changes.

For example, those requiring additional resources (such as growing cities) will frequently be able to meet their needs by acquiring the rights of those who are using water for low-value purposes and are willing to give up their rights, making reallocation both politically attractive and practical. Although there is no unanimity on the concept of water rights and it is not simple to introduce it in administratively weak environments, there has been substantial progress in recent years in a number of nations, including Brazil, Chile, Mexico, and South Africa.

**Investing in infrastructure**

Developing countries need to make large investments in infrastructure of all scales, ranging from local rainwater harvesting structures to major infrastructure such as dikes, canals, dams, and interbasin transfers.

However, World Bank involvement in major hydraulic infrastructure has declined substantially over the past decade, in large part due to concerns about social and environmental impacts. The new Strategy argues that this de facto withdrawal needs to be reconsidered.

As water challenges grow in scale and complexity, the Bank is perceived as one of the few institutions that can provide integrated support on the macroeconomic, financial, technical, social, and environmental dimensions. Borrowers find that the Bank is unique in performance, knowledge, convening power, and relations with almost all riparian countries. It combines knowledge and financial resources. It can engage at all scales—local watershed, city, irrigation district, river basin and aquifer, country, and regional—and help develop an integrated response. The World Bank, the International Finance Corporation, and the Multilateral Investment Guarantee Agency are also indispensable in attracting much-needed investment by the private sector.

**A tailored approach**

The 1993 Water Resources Management Policy Paper and the complementary new Strategy provide broad principles for World Bank engagement, but these general principles need to be adapted to specific economic, political, social, cultural, and historical circumstances.

An important new instrument in this effort is the Country Water Resources Assistance Strategy, which will pull together the specific water resource challenges and development opportunities in a particular country at a particular time; the Country Assistance Strategy that the government and the Bank have agreed on as a framework for overall engagement, the country’s Poverty Reduction Strategy (where relevant), and the broad principles articulated in the 1993 Policy Paper and the 2003 Strategy. The resulting Country Water Resources Assistance Strategy will provide an explicit program of Bank lending and non-lending support in water. Five pilot country strategies have been completed in Azerbaijan, Brazil, China, Pakistan, and Yemen. A second round is under preparation.

**Water resources and the environment**

The environment is, of course, a special "water-using sector," in that most environmental concerns are a central part of overall water resources management. Environmental concerns, such as legal and regulatory instruments governing water allocation, environmental assessment, and pollution control all form part of the core water resources management activities. In ad-
dition, there are important environmental service activities associated with water resources, such as:

- **Terrestrial services**, including management of forests and land in watersheds, which are essential for moderating hydrological variability, reducing silt, and conserving biodiversity. In the past decade there has been a rapid increase in World Bank activity in watershed management at different scales, ranging from land management of the whole of the Loess Plateau in China, to community-based watershed management in the foothills of the Himalayas. The core lesson from these experiences is ensuring that such activities produce economic benefits for local people—particularly the poor, who often inhabit these fragile areas—and give them an incentive to maintain such activities. Water utilities and hydropower companies are increasingly developing innovative partnerships with upstream communities for maintenance of catchment quality.

- **Aquatic services**, including the conservation and management of wetlands and floodplains, both underpin the fisheries and crop production systems on which many poor communities depend and serve vital functions in attenuating extreme hydrological events. The report of the World Commission on Dams has correctly stressed that the rights of “downstream ecosystems and people” have historically been ignored. Here, too, new forms of practice are evolving, with maintenance of ecological flows now becoming an issue to be addressed early in project design. The World Bank is actively bringing best practice to bear in this area.

### Main messages of the new strategy

In closing, some of the main messages of the Bank’s new Water Resources Strategy are the following:

- Water resources management and development is central to sustainable growth and poverty reduction and therefore of central importance to the mission of the World Bank.

- Most developing countries need to be active both in management AND development of water resources infrastructure.

- The main management challenge is not simply a general vision of integrated water resources management but a “pragmatic but principled” approach that respects principles of efficiency, equity, and sustainability, while also recognizing that water resources management is intensely political, and that reform requires the articulation of prioritized, sequenced, practical, and patient interventions.

- The World Bank needs to assist countries in developing and maintaining appropriate stocks of well-performing hydraulic infrastructure and in mobilizing public and private financing, while meeting environmental and social standards.

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Water Supply and Sanitation

Creating a Clean and Healthy Environment

For millions of people, environmental squalor starts at their doorstep. Lack of adequate water supply and sanitation turns their surroundings into a polluted, unhealthy, and undignified place to live and degrades water quality in rivers, lakes, and aquifers downstream. The poor suffer most as they often depend directly on these water bodies for their needs. The provision of water supply and sanitation services is a vital part of building communities that can take control of their lives and make real strides on the path to sustainable development.

Water supply and sanitation — A millennium priority

Improving water supply and sanitation services is now recognized as a critical component of poverty reduction, as well as making progress in health, education, gender, and environmental sustainability.

The Millennium Summit, the International Conference on

FACTS AND FIGURES

- In the developing world, 2 out of every 10 people are without access to safe water supply, 5 out of 10 live without adequate sanitation, and 9 out of 10 do not have their wastewater treated.
- Every year 2.2 million people die from diarrheal diseases.
- The urban population is expected to grow by 1 billion people in the next 15 years, many of whom will live in unsanitary slums.
- The Millennium Development Goals (MDGs) set targets to reduce by half the number of people without sustainable access to drinking water and basic sanitation by 2015.
- The MDG targets imply that an additional 1.5 billion and 2 billion people will need access to safe water and sanitation, respectively, between 2000 and 2015.

Number of new people with access to WSS per day

|               | 1991-2000 | 2001-15*
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<tbody>
<tr>
<td>Water supply</td>
<td>400,000</td>
<td></td>
</tr>
<tr>
<td>Sanitation</td>
<td>300,000</td>
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* Needed for MDG.
Financing for Development at Monterrey, and the World Summit on Sustainable Development (WSSD) at Johannes- burg moved water supply and sanitation out of its narrow sectoral purview into the broader poverty reduction agenda. At the WSSD, water and sanitation was selected as one of the five key areas needed to improve the lives of all humans while protecting the global environment. The target to improve access to sanitation was one of the few new international commitments made at the WSSD.

Time to move to action

Water supply and sanitation is high on the development agenda. The challenge is to seize the opportunity and translate the new global targets into improvements on the ground.

Within the international community, it is widely acknowledged that increased investments in water supply and sanitation—accompanied by decisive institutional and financial reforms—are urgently needed.

Effective institutions at all levels are needed to sustain past and future investments. Sound governance includes a clear division of responsibilities and lines of accountability among sector institutions. Empowered communities need to be able to call public officials and public and private service providers to account for their policies, actions, and use of funds. Local governments need strengthened capacity to meet the challenge of increased responsibility and decentralized budgets.

The main sources of funding for water supply and sanitation are users and domestic taxpayers. All other financing sources—with the exception of limited grants by international donors—are premised on sustainable finances from these two sources. Of course, tariff setting should take into account social and environmental considerations.

Special attention to environmental sustainability

In the water and sanitation services sector, three interventions—sanitation and hygiene, wastewater treatment, and water conservation—play a major role in improving healthy living conditions for all in a sustainable environment.

Sanitation and hygiene. Sanitation coverage continues to lag far behind water supply. Compared with water supply, sanitation and hygiene require distinct approaches for three main reasons. First, the benefits of improved sanitation and hygiene depend largely on investment decisions at the household level. Second, the demand and willingness to pay for sanitation and wastewater treatment lag behind those for water. Third, sanitation and hygiene require a change in behaviors, not just investment.

The energies of all parties need to be harnessed to promote and support changes in household behaviors. Sanitation professionals need to team up with social marketing and health and environmental education specialists.

Successful programs require stakeholder consultation and the matching of supply to demand. Consumers are willing to pay for sanitation services, provided they have a strong voice in the level and quality of service.

The greatest sanitation challenge lies in the rapid growth of high-density slums. Given the current and projected scale of the problem in urban areas, more emphasis should be placed on building sanitation firmly into the urban development agenda. The process of upgrading informal settlements needs to be accelerated with due consideration to sanitation services. In the meantime, the informal sector should be supported to serve these communities.

THE WORLD BANK AND WATER SUPPLY AND SANITATION

The World Bank supports the water supply and sanitation sector through specific interventions and through joint activities with other sectors, from city governance and services to public health, water resource management, municipal finance, and environmental management. The World Bank lends about $1 billion per year for water supply and sanitation, and supports nearly 100 countries through advisory work and policy dialogue.

Regional distribution of IBRD/IDA financing for water supply and sanitation, FY1990–2002
Better sanitation services require action in other sectors. Sanitation strategies must fit into broader city level and rural development strategies, building codes, and land use and solid waste policies.

**IMPROVING SANITATION IN OUAGADOUGOU, BURKINA FASO**

The Ouagadougou Strategic Sanitation Plan (PSAO) is an integrated sanitation and hygiene promotion program implemented by the National Water and Sanitation Office with the support of a local NGO (ADRA) and a regional training center (CREPA). The plan recognizes that conventional sewage is not an affordable option for all and expects 80 percent of the city's population to adopt on-site sanitation solutions. Through PSAO, thousands of people have upgraded their latrines and installed soakaways. Consumers are informed about the technical options available and negotiate the work with trained artisans. Some subsidies are available—funded by a surcharge levied on water bills. The PSAO has shown that a community-based and pragmatic approach to environmental sanitation, using low-cost technology, can yield results, even in urban areas. A reliable and autonomous source of funding was a key to the sustainability of the program.

Wastewater treatment. The discharge of untreated wastewater is a growing environmental concern, with many rivers being turned into open sewers. Only about 10 percent of wastewater in developing countries is collected and only about 10 percent of existing wastewater treatment plants operate reliably and efficiently. Expansion of water supplies without simultaneous wastewater collection and treatment facilities can lead to environmental and public health problems. Due to the sequencing of demand (people generally want water first, then sanitation, then wastewater treatment), step-wise approaches are needed in line with local demand and local institutional and financial capacity. Sequencing of improvements requires careful planning, starting with on-site solutions, followed by sewerage systems for urban areas that have reached higher levels of water usage, and—as a last step—sewage treatment plants.

Wastewater treatment investments will require massive levels of incremental funding. In order to reach the water and sanitation MDGs, it is estimated that annual investments will need to double from the historical level of $15 billion to $30 billion. These numbers do not include wastewater treatment costs, which depend on the type and level of service provided and local conditions. But even with simple treatment systems, the Global Water Partnership has estimated that annual investments for municipal wastewater treatment should increase to $70 billion.

Municipal wastewater treatment cannot be implemented in isolation from broader actions at the river basin or aquifer level. Often, municipal wastewater treatment alone can only bring marginal environmental benefits as on-site wastewater disposal and non-point source pollution can account for a large share of pollution loads at a regional scale.

**URBAN WATER QUALITY AND POLLUTION CONTROL PROJECTS IN BRAZIL**

World Bank-supported projects in São Paulo, Curitiba, and Minas Gerais represent the first generation of projects in Brazil based on an integrated view of urban water quality and pollution control. This integrated approach is essential for prioritizing investments in a resource-constrained environment and for involving the municipal, state, and federal stakeholders in the implementation of the required institutional and legal reforms. The three projects combine technical and legal instruments and support the upgrading of slums, which are major contributors to the pollution of water bodies.

**WATER CONSERVATION IN SINGAPORE**

In Singapore, a water-scarce city-state, the Public Utilities Board provides water supply to a population of about 2.8 million. Fresh water thus has a high value and water conservation is economically worthwhile. By sustaining a metering and leak reduction program, the Public Utilities Board has succeeded in reducing unaccounted-for water (physical and commercial losses) from the already low level of 10 percent in 1989 to 6 percent in 1994.

The recently endorsed Bank strategies on environment, energy, rural development, and water resources, and the 2003 World Development Report, present a clear and logical framework to approach water resources development and management in an environmentally and socially responsible way. They also underscore the multiple values of water and water-based ecosystems (see Figure, at left). This article reviews selected operational challenges at the global, regional, national, and river-basin levels associated with the implementation of this framework.

Climate variability and change — The case of Kenya

Climate variability and change pose perhaps the most significant water resources challenge of this century. Climate variability influences the amount, timing, and frequency of rainfall, floods, and droughts. Global warming will alter precipitation, evaporation, and snowmelt and will enhance the impacts of climate variability. These changes will impose huge costs on national economies and on climate-sensitive sectors such as agriculture, irrigation, and hydropower, among others. Most countries are ill equipped today to adequately address the multi-sectoral nature of water resources management. Mitigation and adaptation to climate variability and change will require an even higher level of technical and institutional capacity to manage water.

The case of Kenya illustrates the extent of the costs imposed by climate variability. The El Niño floods of 1997–98 and La Niña drought in 1998–2000 caused direct economic losses equivalent to 11, 16, and 16 percent of GDP in those three years, including about $777 million in damaged transportation infrastructure, $1.4 billion in industrial production (largely associated with reduced hydropower production), and over $300 million in agricultural and livestock losses. GDP growth dropped from 4.6 percent in 1996 to −0.3 percent in 2001.

A key factor that contributed to Kenya’s losses was inadequate investment in sustainable infrastructure to control floods or store water for use during droughts. Kenya’s total storage capacity of about 60 m³/capita is less than 10 percent that of South Africa, and 1 percent of Australia or the United States. The widespread destruction of natural storage capacity—due to severe catchment degradation, threatened lakes, and encroached recharge areas, wetlands, and floodplains—compounded the impacts of floods and droughts. The weaknesses of the water allocation and pollution control systems were another factor. Finally, several hydropower dams, irrigation schemes, and water supply projects developed in the 1980s and 1990s—but without proper regard for the social, environmental, and economic consequences—have failed to achieve the expected benefits. Two examples are the overdesigned and costly Turkwell Dam and the Tana Delta.
Irrigation scheme. In 1987, the Bank-financed Mombasa water supply intake was abandoned after only six years of operation because of excessive siltation caused by severe upstream erosion.

Investing in water resources infrastructure in Kenya is a fundamental part of dealing with climate variability and change. However, new storage infrastructure is not enough. Kenya needs fair water allocation and pollution control systems, catchment management, and a program to restore its natural storage capacity. The Kenya Water Resources Sector work supported by the Bank is promoting a reform program and a mixture of structural measures and nonstructural elements with careful examination and mitigation of social and environmental issues.

Hydraulic infrastructure development — The downstream challenge

As noted in the Bank’s Water Resources Sector Strategy, many hydraulic infrastructure projects have handled downstream environmental effects poorly and undermined the livelihoods of downstream communities, particularly the poor who depend on aquatic ecosystems. A disproportionate number of complaints filed with the Bank’s Inspection Panel have been for water and dam projects, and many of these complaints concern downstream issues.

The challenge facing the Bank and its client countries is to ensure that the social and environmental impacts on both upstream and downstream communities and ecosystems are properly recognized and addressed systematically and in a timely manner with the participation of—and accountability to—impacted communities. This is technically challenging. It entails defining the complex links among water flow, water quality, and land use; the interdependencies of terrestrial and aquatic ecosystems; and the direct and indirect values that dependent communities attach to the proper functioning of these ecosystems. Given the diversity of interest groups, the decisionmaking often entails difficult trade-offs. The Bank has gained considerable experience in systematically addressing environmental and social issues upstream of major dams and other hydraulic infrastructure, and its experience with downstream issues is growing.

Environmental Flow Assessments are tools developed to ensure that river flows maintain downstream ecological functions after hydraulic structures have been built. The experience with their use is growing, but there is a need for systematic application and for improving the analytical capability to determine the appropriate releases, the linkages between downstream biophysical changes and socio-economic impacts, and the necessary mitigation and compensation programs. The World Bank-supported Lesotho Highlands Water Project—based on the 1986 treaty between the Governments of Lesotho and South Africa—provides a unique example of how downstream social and environmental impacts are being integrated systematically in the operation of two of Africa’s largest dams through an instream flow requirement policy. This policy defines modified water-release levels, as well as mitigation and compensation measures for impacted communities downstream.

Reforms in water, energy, and irrigation — Emerging environmental challenges

The World Bank has supported the reforms of public institutions and, where appropriate, the participation of the private sector in water supply, energy, and irrigation. The economic and financial regulatory aspects of these reforms have received greater attention. The current operational challenge is to improve the social and environmental dimensions of these reforms; to strengthen water resources and environmental regulatory capacity; and to establish clear guidelines for ensuring fair access to water, protect environmental quality, and include affected parties in a transparent decisionmaking process. Coordinated planning of investments in these sectors is also needed, notably in sewerage and wastewater treatment in water supply, drainage in irrigation, and adequate environmental flows in hydropower.

Innovative mechanisms—such as payments for ecological services—are bringing in water and energy utilities as partners to support the protection of natural resources. Under the Bank-supported Ecomarkets project in Costa Rica, several private and public sector companies are paying for the protection of the watersheds in which they have power generation or water treatment plants. In the proposed Venezuela Canaima National Park Global Environment Facility (GEF) medium-sized project, the electricity utility CVG-EDELCA would provide similar support to watershed conservation.

International waters — The environmental flows challenge

The management of international rivers, aquifers, lakes, and wetland ecosystems is a growing part of World Bank and GEF support. Some of the key issues in this context include the allocation and sharing of water resources to serve expanding populations and economic growth; pollution control and water quality management; and protection of freshwater, coastal, and marine ecosystems. While international waters can be flashpoints of conflict among nations sharing these resources, they can also be opportunities for cooperation and integration.
in the search for joint development opportunities.

Among the challenges of international waters, environmental flows need particular attention, an issue rarely addressed in transboundary water-sharing agreements. Two leading examples supported by the Bank and GEF to approach this challenge are the Mekong and Senegal rivers. The Mekong River Commission is supporting an environmental flow assessment as input to its water utilization program, a precursor for future investments in upstream hydraulic infrastructure. The recently signed Senegal River Water Charter explicitly calls for systematically addressing downstream environmental impacts and flows in the operations of the Manantali hydropower project.

Lakes and reservoirs — Neglected water resources

Even though lakes and reservoirs contain about 90 percent of the earth's surface storage of liquid fresh water and are critical elements of the earth's freshwater hydrological system, they have not received sufficient attention by the global water community. Increasingly, their ecological integrity is threatened. As closed systems with relatively long detention times, they are particularly vulnerable to a range of anthropogenic stresses. In response to the knowledge gap in this area, the World Bank is implementing a GEF Lakes Basin Management Initiative to collect, share, and disseminate lessons to government agencies and other stakeholders involved in lake management programs.

Conclusion

The World Bank faces new operational challenges as it implements its new sector strategies using a more effective business model. This model calls for promoting water resources development and management in an environmentally and socially responsible manner. To respond effectively, the Bank will need to improve its understanding and methodologies on the environmentally sustainable use and quality of water, and support the strengthening of internal and local capacity (including river scientists, freshwater ecologists, and limnologists) to mainstream environmentally issues in water resources and related sectors.

For further information and analyses of these issues, see the new Water Resources and Environment Technical Notes series and Environment Strategy Paper No. 2, Environmental and Water Resources Management.

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Environmental Flows

Linking Catchments to Coasts in Water Resources Management

Water flows from mountains to the sea through an expanding network of streams, rivers, lakes, and wetlands. Because of its heavenly origins, life-giving quality, and cleansing properties, water was considered sacred by ancient civilizations and handled with an ethic of stewardship and respect.

Today, more than ever, clean flowing water is an essential resource. Humans withdraw about 20 percent of the normal flow of the world's rivers for agriculture, hydropower, and domestic use. The rate of growth of these withdrawals doubles that of the global population. The quality of these flows is highly compromised—by sediments from deforested watersheds, nutrients and pathogens from agricultural runoff and untreated waste, and heavy metals, PCBs, and persistent organic pollutants. Many downstream populations receive either too much or too little water or contaminated water that is unsuitable for use and compromises the aquatic resources that support their livelihoods.

These downstream impacts are felt most acutely in the coastal zone, where more than half of the world's population...
lives, and 12 of the world's 17 megacities (populations of over 10 million) are located. The coastal ecosystems support multi-billion-dollar industries in ports and shipping, fisheries, tourism, and mineral exploration. The trends are increasing exponentially: by 2015, the projected four new megacities will be coastal, and by 2030 two-thirds of the world's population will live along a coast.

In the fragile coastal zone, overburdened and poorly maintained sewerage systems and inadequate wastewater treatment lead to contaminants seeping into aquifers and untreated wastewater affecting fresh surface and coastal waters. These local impacts are compounded by upstream catchment activities. The most graphic examples are the deoxygenated dead zones at the mouths of major rivers such as the Mississippi; siltation of coral reefs from uncontrolled logging, as in the Palawan Island, Philippines, or the Athi-Galana-Sabaki River Delta in Kenya; and the hyper-saline deltas and estuaries of the Senegal and lower Indus rivers. The impacts of upstream activities are felt in many other coastal regions. One example is the disruption of freshwater flushes that provide breeding and migration cues for fish and invertebrates. In addition, sediments that provided the substrate for seagrass beds now blanket and smother these productive ar- eas, and coral reefs that evolved over millions of years in nutrient-poor, clear tropical waters now receive pulses of nutrients, causing algae blooms that block sunlight and cover the reef, undermining its very structure, and tourism with it.

The divorce between the management of downstream and upstream portions of catchment-river-coastal systems is at the root of these problems. The impacts of upstream infrastructure, poor land use practices, and contaminated runoff on coastal and near-shore environments are seldom considered. Some still believe the oceans have infinite capacity to absorb land-based pollution. Others consider water that is not captured by agriculture or cities and actually reaches the sea as a lost resource.

Failure to manage water as one continuous system from catchment to coast is not limited to industrial countries. Many developed countries also are grappling with the most appropriate governance arrangements to accommodate competing interests, while maintaining environmental flows. Australia's Great Barrier Reef, where tourism and fisheries bring in AS1.5-2 billion annually, has faced serious threats from cattle ranching and agriculture in coastal catchments. There are now attempts to manage these catchments in partnership with all stakeholders.

The Bank's experience in addressing catchment-to-coast linkages is still limited, but evolving. Coastal managers are generally more aware than their riverbasin counterparts of the need to look upstream for impacts that may affect the sustainability of coastal ecosystems and livelihoods. While Integrated Riverbasin Management is now widely viewed as the paradigm for management of freshwater systems, Integrated Coastal Area and Riverbasin Management is just beginning to be used. The Cetina Watershed that drains into the Adriatic, and the remediation of the Daima Dam in the lower Senegal River are two examples of this approach.

Innovative water policies for freshwater management, such as South Africa's "water reserve" (which provides basic water requirements for human needs and for ecosystem functions), can provide useful models for combined freshwater-coastal management. In the case of international waters, Transboundary Diagnostic Analysis has proved to be a powerful tool to evaluate threats to the Black Sea Large Marine Ecosystem. It provides input to the cooperation and management efforts among riparians in the Danube and Black Sea Basins through the Strategic Partnership for Nutrient Reduction, which is co-financed by GEF, the Bank, and numerous other partners in the region.

The key challenge is to build an understanding in all segments of society that development and management interventions upstream can seriously affect the ecological integrity of freshwater, coastal, and near-shore systems and the human populations who depend on them. Once this understanding has taken root, there are many planning instruments that can be used to identify these linkages and minimize impacts down-stream, such as Strategic Environmental Assessments and Environmental Impact Assessments, supported by remote sensing and water quality monitoring data systems. In the Bank, the cross-sectoral and vertical linkages from catchments to coasts are becoming an important element of how we jointly implement our Environment and Water Resources Sector strategies.


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ANNUAL REVIEW • JULY 2002–JUNE 2003 (FY03)
ne of the most successful aspects of the Johannesburg World Summit on Sustainable Development (WSSD) was its focus on partnerships for sustainable development. Over 300 voluntary, non-negotiated partnerships between governments, business, and civil society were featured on the United Nation website (with approximately $300 million in resources), and over 60 partnerships were launched in Johannesburg. The Summit's main document, the Johannesburg Plan of Implementation (POI), makes clear that these partnerships complement and do not substitute for intergovernmental commitments.

A World Bank analysis of these partnerships and the Johannesburg POI showed that our sector strategies, investment programs, and poverty focus in support of the Millennium Development Goals were fully aligned with the WSSD priorities. The Bank is also involved in most of the larger partnerships, either through financial support from the Development Grant Facility (with a budget of $157 million in fiscal 2003, covering 48 grant programs), or through project financing, analytical work, and support to country programs. We review here progress in a few of these partnerships.

Africa stockpiles programme

African development issues—from HIV/AIDS to access to energy—were a major focus of the WSSD. One of the Africa-focused partnerships is the Africa Stockpiles Programme (ASP), which is led by the Bank, World Wildlife Fund (WWF), and the Food and Agriculture Organization (FAO). Over the past 40 years, virtually every African country has accumulated stockpiles of obsolete pesticides that are posing serious health threats (estimates indicate at least 50,000 tons of obsolete pesticides, and tens of thousands of tons of contaminated soil). The objective of the ASP is to clean up stockpiled pesticides and pesticide-contaminated waste in an environmentally sound manner and to provide capacity building on chemicals-related issues.

The ASP initiative is expected to last between 12 and 15 years and cost a total of $250 million. The first five-year phase will cover seven countries, prepare 15 more, and cost about $70 million. The partnership has raised $48.5 million in firm pledges and commitments, including a $30 million contribution by Croplife International.

Global village energy partnership

The Global Village Energy Partnership (GVEP) aims to accelerate the provision of modern energy services to the rural poor. It brings together consumers, suppliers, and a wide range of stakeholders to promote linkages between energy and poverty reduction in rural areas, facilitate the development and implementation of service delivery models, and
catalyze the scaling up of investments in rural energy.

Since the WSSD, the list of partners continues to grow: 221 organizations (including 103 NGOs, 74 private-sector firms, 36 government agencies, and 8 multilateral agencies) have signed the GVEP Statement of Principles. Regional multi-stakeholder workshops have been held in Africa, Latin America, and South Asia. Funding for the GVEP is provided by Canada, Germany, Switzerland, the United States, UN Foundation, and UNDP, among others. Negotiations are under way with donors to raise the current funding from $1.9 million to $2.9 million.

**WWF/World Bank forest alliance**

At the UN Conference on Environment and Development (Rio +5) in New York in 1997, the presidents of the World Bank and World Wide Fund for Nature announced the establishment of the Alliance for Forest Conservation and Sustainable Use. This partnership supports the goal of ensuring sustainable livelihoods for forest-dependent poor and indigenous peoples. The Alliance has three broad targets: 50 million hectares of new forest protected areas; a comparable area of existing but highly threatened forest protected areas secured under effective management; and 200 million hectares of production forests under independently certified sustainable management.

Now in its fifth year, the Alliance has proved to be a highly successful collaboration. This was evident again at the WSSD, where Brazilian President Fernando Cardoso—joined by the World Bank president, the WWF Director General, and the GEF CEO—announced the most significant tropical forest conservation initiative in history. The Amazon Region Protected Areas Program sets aside 50 million hectares of Amazon rainforest under federal protection over the next 10 years, including samples of all 23 Amazonian eco-regions. This program will triple the amount of protected Amazon rainforest to about 12 percent of Brazil’s total forest area—twice as big as the United Kingdom.

**Poverty environment partnership**

One of the major breakthroughs of the WSSD was the recognition by the over 180 participating governments that responsible economic growth meant that environmental and social considerations have to be factored into their policy choices. The lack of solid analytical work linking natural resources and poverty hinders the consideration of these linkages in policy decisions. OECD, UNDP, DFID, and the Bank are the founding members of the Poverty Environment Partnership (PEP), an informal network that now includes over 10 bilateral and multilateral partners. PEP’s objective is to build a consensus on the critical links between poverty and the environment and to address knowledge gaps.

At Johannesburg, the first major report of the PEP was launched— **Linking Poverty Reduction and Environmental Management: Policy Challenges and Opportunities.** PEP has now expanded its work to poverty and climate change and has begun interagency work on environmental health issues.

**Community development carbon fund**

Founded by the Bank and the International Emissions Trading Association, the Community Development Carbon Fund (CDCF) operates through the Kyoto Protocol’s Clean Development Mechanism. This pioneering program allows OECD countries to fulfill some of their greenhouse gas emission reduction commitments by financing small-scale greenhouse gas reduction projects in the least-developed countries and in poor communities in developing countries. The CDCF supports initiatives with significant and measurable community development benefits in fields such as renewable energy, energy efficiency, and solid waste to energy conversion.

At its first annual meeting held in July 2003 in Washington, the importance of the Fund as a vehicle to bring benefits from the Kyoto Protocol to some of the poorest countries and communities was made abundantly clear. Based on indications from a number of companies and governments worldwide, the Bank expects the CDCF to more than triple its capitalization to $100 million by early 2004.

**Global reporting initiative**

One of the most debated issues at the Summit was corporate social responsibility (CSR). There is a broad-based and growing international movement to encourage companies and organizations to voluntarily integrate social and environmental concerns into their operations.

The Global Reporting Initiative (GRI) often provides an intellectual framework for analyzing CSR issues. GRI’s mission is to develop globally applicable guidelines for reporting on the economic, environmental, and social performance of an organization. Since its launch in 1997, a wide range of stakeholders—including business, nonprofits, accounting bodies, investor organizations, and trade unions—have participated in the GRI. An agreed set of revised 2002 Sustainability Reporting Guidelines was released at the Johannesburg Summit.

As part of its commitment to CSR, the Bank has provided $300,000 to the GRI through the Development Grant Facility; additional support has been approved for fiscal 2004.

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Protected Areas as Tools for Water Conservation and Management

Enterprise and Job Development in Biodiversity Projects in Ukraine and Romania

The Danube Delta, one of Europe's largest natural wetlands, covers 564,000 hectares, including 122,000 hectares in Ukraine and 442,000 hectares in Romania. The reedbeds, riparian forests, dunes, and open waters of the maze of tributaries of the Danube River provide critical habitat for over a million migratory and resident waterbirds. The delta ecosystem has been a source of subsistence and income to humans for over 500 years, but over the last 50 years fish harvests have significantly declined.

Two complementary projects—the transboundary Romania-Ukraine Danube Delta Biosphere Reserve and the Danube Delta Biosphere Reserve (DBR) Project—have improved collaboration between Romania and Ukraine, especially through joint programs and exercises in warden training and through exchange of regional expertise on scientific and wetlands management issues. The projects also have promoted collaboration with other European organizations engaged in coastal management and nature conservation.

Sustainable use and protection of wetland biodiversity was a key element of the DBR project, which was supported with a $1.5 million GEF grant. Since the project was completed in 1999, the DBR has been developing revenue sources and creating jobs through ecotourism and reed harvesting. Private commercial companies are now invited to harvest the biosphere's reeds, based on the DBR's sustainable use plans. Reed harvesting revenues have more than doubled from 2000 to 2002 and have created about 1,000 jobs, improving the local population's benefits and stake in the reserve.

Conservation and wise use of natural ecosystems is a central pillar of World Bank assistance and is embodied in the new World Bank Environment Strategy. A key challenge for the Bank and its borrowers is to find ways to promote development that encourages both biodiversity conservation and poverty alleviation. Protected areas are the cornerstones of biodiversity protection, but they can also provide other goods and services, many of them fundamental to poverty alleviation and sustainable livelihoods.

Today the World Bank is the largest single international funding source for biodiversity projects, with more than $3 billion in loans, credits, and grants since the Rio Summit and the Fourth World Parks Congress in Caracas. A new report, prepared for the Fifth World Parks Congress in Durban, shows that since 1988 the Bank has contributed more than $3.2 billion in loans, grants, and co-funding to support 10 regional programs, as well as individual reserves and protected area networks in 85 countries.

Throughout the world, the Bank is supporting the establishment of new conservation areas (Brazil, Indonesia, Laos, Panama) as well as strengthening management of existing parks in tropical and boreal forests (Ecuador, Georgia, India, Peru, Poland, Russia); natural grasslands and savannas (Argentina, Côte d'Ivoire, Kenya, Uganda); montane habitats (Bhutan, China, Morocco, Turkey); unique habitats such as forests on karst limestone (Croatia, Vietnam); marine systems (Indonesia, Mesoamerica); and freshwater lakes and wetlands. In many countries, including Brazil, India, Indonesia, and Madagascar, such protected area programs are explicitly linked to sustainable livelihoods and improved resource management by local communities.

The Bank programs in biodiversity include activities in buffer zones and biological corridors; sustainable financing mechanisms; new management arrangements for protected areas by communities, indigenous peoples, and the private sector; control of invasive alien species; and ecotourism.

The roles and services of watershed forests

Forests and other natural ecosystems not only maintain biodiversity, they also bestow ecosystem, resource, and health services. They serve as buffers against the spread of disease, pollution, and pests. Natural habitats stabilize coastlines and protect landscapes, soils, and watersheds. Forest ecosystems play a role in influencing rainfall regimes and climate at local and regional levels, helping to contain global warming through carbon sequestration and storage in soils and plant biomass.
The role of many protected areas as "water towers" is increasingly recognized. Bank projects in 14 countries are helping to strengthen the management of key protected areas that serve as water towers from major cities such as Abidjan, Caracas, Dar es Salaam, Jakarta, Johannesburg, Mexico City, Mumbai, Nairobi, and Sofia—see Table.

Over the last decade, a number of World Bank projects have expanded the traditional linkage between forests and biodiversity to consider carbon sequestration and watershed values associated with erosion control, clean water supplies, flood control, and coastal protection. Many protected areas can be justified for their economic benefits alone.

For example, after the severe floods of 1998, the Chinese government requested Bank support for the Natural Forest Protection Program, which is designed to ensure the long-term protection of national forests in watershed catchments and reduce vulnerability of downstream villages and towns to flooding. Approximately 50 million hectares, more than half the country's natural forests, will now be re-assessed (according to their biological and protection values) for designation as nature reserves, forest parks, watershed forests, or areas for selective logging. In Costa Rica, the Ecomarkets project is supporting development of markets for ecosystem services, thereby fostering conservation of forest ecosystems on privately owned lands outside protected areas in the Meso-American Biological Corridor. In Bulgaria, natural and restored wetland protected areas are serving as natural filters to extract pollutants from the Danube River system.

Coastal forest projects in Croatia, Bangladesh, Honduras, Lithuania, and Vietnam are improving management of coastal forests, swamps, floodplains and mangroves, including restoration of degraded habitats. Forest services such as coastal protection and nursery grounds for quality fisheries are increasingly being recognized as essential to these countries' coastal economies. In Ecuador and Argentina, flood control projects utilize the natural storage and recharge properties of critical forests and wetlands by integrating them into "living with floods" strategies.


Parks and protected areas in the World Bank biodiversity portfolio, 1988–2003 (which also provide protection of water supplies for major cities and other economic activities)

<table>
<thead>
<tr>
<th>Country</th>
<th>Protected area</th>
<th>Major city drinking water</th>
<th>Other biological and economic values</th>
</tr>
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<tbody>
<tr>
<td><strong>ASIA</strong></td>
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<tr>
<td>China</td>
<td>Qinling Mountains</td>
<td>Xi’an</td>
<td>Panda reserve</td>
</tr>
<tr>
<td>India</td>
<td>Periyar, Kerala</td>
<td>Tamil Nadu</td>
<td>Tiger reserve Irrigation &amp; hydroelectric power</td>
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<tr>
<td></td>
<td>Pench</td>
<td>Bhopal</td>
<td>Tiger reserve Hydroelectric power</td>
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<tr>
<td></td>
<td>Erivakulam</td>
<td>Munnar</td>
<td>Western Ghats hotspot</td>
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<td></td>
<td>Borivill N.P</td>
<td>Mumbai</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Ranthambhore, Rajasthan</td>
<td>Sawai Madhopur</td>
<td>Tiger reserve Water aquifer in drought-prone area</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>Tourism</td>
</tr>
<tr>
<td>Indonesia</td>
<td>Gunung Gede-Pangrango</td>
<td>Jakarta</td>
<td>Javan endemics</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>Water generation $1.5 billion annually for agriculture</td>
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<td></td>
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<td></td>
<td>&amp; domestic use</td>
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<tr>
<td></td>
<td>Gunung Gede-Pangrango</td>
<td>Bogor, Sukabumi</td>
<td>Tourism and recreation</td>
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<td></td>
<td>Kerinci</td>
<td>Jambi, Padang</td>
<td>Sumatran fauna</td>
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<td></td>
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<td></td>
<td>Water for 3.5 million people &amp; 7 million hectares of</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>agriculture</td>
</tr>
<tr>
<td>Philippines</td>
<td>Northern Sierra Madre</td>
<td>Manila</td>
<td>Philippine endemics/hotspot</td>
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<tr>
<td><strong>LATIN AMERICA &amp; CARIBBEAN</strong></td>
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<tr>
<td>Chile</td>
<td>Santiago foothills forests</td>
<td>Santiago</td>
<td>Forests provide 20% of potable water for Santiago</td>
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<tr>
<td>Ecuador</td>
<td>Andean protected areas</td>
<td>Quito</td>
<td>80% of Quito’s 1.5 million population receive water from</td>
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<tr>
<td></td>
<td></td>
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<td>two protected areas</td>
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<tr>
<td>Haiti</td>
<td>La Visite N.P</td>
<td>Port au Prince</td>
<td>Andean hotspot</td>
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<td>Pic Macaya</td>
<td>Les Cayes</td>
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<td>Mexico</td>
<td>Maniposa Monarca</td>
<td>Mexico City</td>
<td>Monarch butterflies; Tourism</td>
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<td>Venezuela</td>
<td>El Avila N.P</td>
<td>Caracas</td>
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<td>Banco N.P</td>
<td>Abidjan</td>
<td>Tourism</td>
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<td>Kenya</td>
<td>Aberdare &amp; Mt Kenya N.P</td>
<td>Nairobi</td>
<td>Tourism</td>
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<tr>
<td>South Africa</td>
<td>Maloti-Drakensberg</td>
<td>Durban</td>
<td>World Heritage site; Tourism</td>
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<tr>
<td></td>
<td>Maloti-Drakensberg</td>
<td>Johannesburg</td>
<td>Transfrontier area.</td>
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<tr>
<td></td>
<td>Cape Peninsula N.P</td>
<td>Cape Town</td>
<td>Proposed World Heritage site; Tourism</td>
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<tr>
<td>Tanzania</td>
<td>Udzungwa N.P</td>
<td>Dar es Salaam</td>
<td>Eastern arc forests – endemism</td>
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<tr>
<td><strong>EASTERN EUROPE &amp; CENTRAL ASIA</strong></td>
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<tr>
<td>Bulgaria</td>
<td>Rila &amp; Vitocha N.P</td>
<td>Sofia</td>
<td></td>
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</tbody>
</table>

The safeguard policies at the World Bank (IBRD and IDA)

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
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<tbody>
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<td>OP/BP 4.01</td>
<td>Environmental Assessment</td>
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<td>OP/BP 4.04</td>
<td>Natural Habitats</td>
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<td>OP 4.09</td>
<td>Pest Management</td>
</tr>
<tr>
<td>OP/BP 4.12</td>
<td>Involuntary Resettlement</td>
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<td>OD 4.20</td>
<td>Indigenous Peoples</td>
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<td>Safety of Dams</td>
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<td>OPN 11.03</td>
<td>Cultural Property</td>
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<td>OP/BP 7.50</td>
<td>Projects on International Waterways</td>
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<tr>
<td>OP/BP 7.60</td>
<td>Projects in Disputed Areas</td>
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</tbody>
</table>

For the full text, please visit our website: <<www.worldbank.org/safeguards>>.

Mainstreaming safeguard concerns in Bank lending

During fiscal 2003 the number of projects approved by the Bank increased by about 13 percent (259 new projects in fiscal 2003 vs. 229 the previous year), and the amount of investment lending increased by 29 percent from $9.7 billion in FY02 (IDA $5.6 billion, IBRD $4.1 billion) to $12.5 billion in FY03. The breakdown of these projects by Environmental Assessment (EA) is shown in the table below.

<table>
<thead>
<tr>
<th>EA categories of investment projects in fiscal 2003</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number (%)</td>
</tr>
<tr>
<td>Category A</td>
</tr>
<tr>
<td>Category B</td>
</tr>
<tr>
<td>Category C</td>
</tr>
<tr>
<td>Category F1</td>
</tr>
</tbody>
</table>

Note: Percentages are rounded and may not total 100.

The proportion of Category A projects (those receiving full Environmental Assessment) in the portfolio remained at 10–12 percent of new lending projects (27 percent in dollar volume). The proportion of Category B and F1 projects increased to 57 percent in number and dollar volume of the new investment lending, compared with 43 percent in the previous year. This is partially explained by more rigorous application of the Environmental Assessment policy to projects in the Human Development area. In new health sector projects, 23 out of the 32 approved projects were in Categories A or B (72 percent of projects in number, 70 percent in dollar volume). All in all, 83 percent of the new investment lending (in volume) has been submitted to Category A, B, or F1 for Environmental Assessment.
Disclosure of safeguards documents also increased, now that the application of the Policy on Disclosure of Information is fully mainstreamed. During FY03, the World Bank received and disclosed 369 Integrated Safeguards Data Sheets (ISDSs; as these are updated and disclosed at least twice during project preparation, these 369 ISDSs cover fewer than 300 projects), 294 EA reports, 80 Resettlement Action Plans and 32 Indigenous Peoples Development Plans. Together, the higher number of projects subject to environmental scrutiny and the larger number of documents disclosed reflect the increased mainstreaming of environmental and social concerns in the Bank’s lending portfolio.

Work has also been done to adapt safeguards to new lending priorities. For example, a noteworthy trend of the new FY03 lending is the larger proportion of Community Based and Community Driven Development (CDD) projects, now making up 20 percent of the Bank-wide new lending (30 percent in Sub-Saharan Africa). These projects are submitted to Environmental Assessment because they fund investment. They receive a specific treatment on a case-by-case basis because of the programmatic nature of the investments and because of the risks of cumulative impacts. During fiscal 2003, guidance was prepared on appropriate scope and levels of EA analysis for CDD projects and the regions are now collaborating on formal technical guidance that is being standardized across regions. HIV/AIDS prevention and treatment projects have also received specific guidance on the application of the safeguard policies in order to mainstream the treatment of common issues, more specifically health care waste management and, in some cases, indigenous peoples.

Other major efforts on safeguards

Other noteworthy activities in fiscal 2003 include the following:

- **Policy Conversion:** The conversion of the Forestry Policy was completed in November 2002 and was the result of a very participatory process, including extensive use of Internet posting and consultation. The new Forests policy puts emphasis on the Bank’s mission to assist in mainstreaming the sustainable management of forest products with active cooperation from local communities.

- **The Indigenous Peoples policy** has been widely discussed this past year. This has been a significant undertaking with lots of feedback from the consultations, which is being integrated into the policy. The expectation is that the policies will be adopted during fiscal 2004. In addition to this effort, a global fund for indigenous people has been created by the Bank that will provide grants to indigenous peoples groups and support for the UN Permanent Forum on Indigenous Issues.

- **The policy on Physical Cultural Property** has been largely completed and is expected to go to the Bank’s Board of Directors before the end of 2003.

- More than 500 staff members were trained on safeguards, at headquarters as well as in field offices. A number of local experts, officials, consultants, and NGO representatives were also trained in the field (over 500 of them during the fiscal year), including at one innovative West African one-week training course in Ouagadougou (Burkina Faso) in November 2002. Among the interesting new training themes is a course linking Environmental Assessment and procurement practices, one on the management of health care waste, and one on the design and monitoring of Environmental Management Plans.

Finally, the World Bank was well represented at the 23rd meeting of the International Association for Impact Assessment, which took place in Marrakech in June 2003 with the theme of “Building Capacity for Impact Assessment.” The declaration coming out of this meeting, known as “the Marrakech Declaration,” sets the framework for the building of a constituency regrouping civil society, the private sector, and the public sector toward a common goal of helping protect vulnerable groups and the environment from the unwanted/undesirable effects of the large investments needed to alleviate poverty.

**Emerging challenges**

The challenges for fiscal 2004 are many, but the safeguard teams in the Regions and at the corporate level are taking them up, including:

- Increasing the client ownership and development effectiveness of safeguard policies

- Broader application of strategic approaches to Environmental Assessment at the sectoral and regional level

- Continued emphasis on strengthening Bank and borrower supervision of Environmental Management Plans

- Building client capacity and using it increasingly where clients have a strong track record of good performance

- Participating actively in integrating safeguard policies in the Bank’s renewed commitment to infrastructure lending and water resources development.

This article was prepared by Jean-Roger Mercier, (202) 473-5565, fax (202) 477-0565, of the Quality Assurance and Compliance Unit, with input from Gloria Davis, (202) 458-2750, of the Policy Review and Dissemination Unit. Website: <www.worldbank.org/safeguards>.
The Environment and Natural Resources Management Portfolio

Overview

In fiscal 2003, the Bank approved 52 investment projects in 42 countries with environmental and natural resource management (ENRM) lending amounting to $1.1 billion. This represented 6 percent of total Bank new lending in the year. In addition, there were 140 new analytical and advisory activities with environmental themes.

Over the last year, the trend in the Bank’s environmental lending has been shifting in response to the new Environment Strategy. Lending for environmental and natural resource management issues is now increasing after a decline over the last few years. In particular, lending for environmental policies and institutions, a key area emphasized by the Bank’s Environment Strategy, is rising sharply.

The environmental content in the Bank’s overall investment portfolio has been on a relatively declining trend, from a high of $2.5 billion in 1996 to $924 million in 2002. In 2003, however, ENRM lending increased to $1.1 billion, and it is expected to reach $2.2 billion in 2004. As a proportion of overall Bank lending, environmental content has risen from 4.7 percent in 2002 to 6.0 percent in 2003.

At the end of fiscal 2003, the total active projects with environmental themes/content (the ENRM portfolio) amounted to $13 billion. This constitutes 13 percent of the total Bank portfolio at the end of fiscal 2003.

Of the $13 billion, the core portfolio (projects with more than 65 percent environmental content) consists of 69 projects representing almost $4 billion in environmental lending.

As much as 78 percent of ENRM portfolio projects are currently being managed by other sector (not environment) units—indicating the extent of environmental mainstreaming.

New coding system for Bank lending

To better track the distribution of the Bank’s work programs, a new two-dimensional coding system was implemented in fiscal 2002. All lending data in this report reflects the new coding system. Each loan is tracked by both theme and sector codes. The 11 theme codes correspond to the goals and objectives of Bank activities, and the 12 sector codes indicate the parts of the economy that directly benefit from Bank support. Environment and natural resource management is 1 of 11 themes.

The new coding system enables the Bank to better manage its portfolio and monitor progress toward achieving its goals as defined by its corporate priorities and the MDGs, while maintaining a focus on economic segments. It allows for up to five themes and five sectors.
sectors per activity, recognizing that many Bank projects are multifaceted.

**ENRM Lending Portfolio**

In terms of thematic distribution, a third of the environmental and natural resource management portfolio consists of lending for pollution management and environmental health issues. An additional quarter of lending goes to water resources management. In response to recommendations made in the Environment Strategy, lending for environmental policy and institutions now accounts for a further 13 percent (increasing from 6 percent the previous year). Land management also remains an important issue, accounting for $1.7 billion in lending in the active portfolio. With nearly $300 million for biodiversity in its active portfolio, the Bank remains one of the largest international supporters of biodiversity projects.

In terms of regional distribution, 41 percent of environmental lending in the active portfolio was in the East Asia and Pacific Region. Most of these projects are focused on pollution management and environmental health issues. The South Asia and Latin America and Caribbean Regions followed, with 17 and 14 percent of the Bank’s environmental lending respectively.

### Analytical and Advisory Activities

Analytical work is the foundation for defining strategic priorities and integrating environmental concerns into projects and programs. The Bank’s analytical and advisory activities include formal environmental reports such as Country Environmental Analysis, informal reports and activities such as policy notes and conferences, and technical assistance programs.

There has been a progressive reversal of the downward trend in non-lending activities observed in the past years. Over the last two years, 10 Country Environmental Analyses and 12 Strategic Environmental Assessments have been launched. In addition, targeted environmental input was provided to 13 PRSP countries. Overall, between fiscal 2002 and fiscal 2003, the number of analytical and advisory activities with ENRM content increased from 115 to 140 products.

### Global Environment Facility

The World Bank is an implementing agency for the Global Environment Facility. GEF projects focus on biodiversity conservation, climate change, international waters, and ozone depletion. In fiscal 2003, 29 new GEF projects were approved for $176 million in GEF financing and additional Bank financing of $103 million. As of July 2003, there were 119 full-size (more than $1 million each) GEF projects amounting to a total of $6.4 billion in total project costs, of which $1.6 billion is Bank financing. Nearly three-quarters (72 percent) of Bank financing in GEF projects is for climate change issues. In addition, there are 58 medium-sized projects (less than $1 million each) representing $39 million in Bank commitments and $237 million in total commitments.

### Montreal Protocol

There were 29 new subprojects in fiscal 2003, including 7 pipeline approvals, 17 investment projects, and 5 non-investment technical assistance subprojects. Approved funding associated with these subprojects amounted to $80.5 million, including $0.4 million for pipeline approvals, $77.6 million for investment projects, and $2.5 million for non-investment technical assistance.

### Thematic Distribution

**Active ENRM Portfolio — Thematic Distribution, FY03**

<table>
<thead>
<tr>
<th>Theme</th>
<th>FY03 Commitments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Biodiversity</td>
<td>($1.4 billion)</td>
</tr>
<tr>
<td>Climate change</td>
<td>($1.3 billion)</td>
</tr>
<tr>
<td>Water resources management</td>
<td>($1.2 billion)</td>
</tr>
<tr>
<td>Environmental policy and institutions</td>
<td>($1 billion)</td>
</tr>
<tr>
<td>Pollution management and environmental health</td>
<td>($4.3 billion)</td>
</tr>
</tbody>
</table>

**Active ENRM Portfolio — Regional Distribution, FY03**

<table>
<thead>
<tr>
<th>Region</th>
<th>Commitments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Latin America and Caribbean</td>
<td>($1.8 billion)</td>
</tr>
<tr>
<td>Europe and Central Asia</td>
<td>($1.6 billion)</td>
</tr>
<tr>
<td>Middle East and North Africa</td>
<td>($2.2 billion)</td>
</tr>
<tr>
<td>South Asia</td>
<td>($1.3 billion)</td>
</tr>
<tr>
<td>Africa</td>
<td>($2.2 billion)</td>
</tr>
<tr>
<td>East Asia and the Pacific</td>
<td>($2.2 billion)</td>
</tr>
</tbody>
</table>

**Analytical and Advisory Activities with ENRM Themes, Fiscal 1999–2003**

<table>
<thead>
<tr>
<th>Year</th>
<th>Activities</th>
</tr>
</thead>
<tbody>
<tr>
<td>FY03</td>
<td>164</td>
</tr>
<tr>
<td>FY02</td>
<td>140</td>
</tr>
<tr>
<td>FY01</td>
<td>80</td>
</tr>
<tr>
<td>FY00</td>
<td>69</td>
</tr>
<tr>
<td>FY99</td>
<td>46</td>
</tr>
</tbody>
</table>

**Active GEF Portfolio — Thematic Distribution, FY03**

<table>
<thead>
<tr>
<th>Theme</th>
<th>FY03 Commitments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Biodiversity</td>
<td>($1.2 billion)</td>
</tr>
<tr>
<td>Climate change</td>
<td>($0.8 billion)</td>
</tr>
<tr>
<td>Multi-sectoral</td>
<td>($0.6 billion)</td>
</tr>
<tr>
<td>International waters</td>
<td>($0.1 billion)</td>
</tr>
<tr>
<td>Ozone depletion</td>
<td>($0.1 billion)</td>
</tr>
<tr>
<td>Additional Bank</td>
<td>($0.1 billion)</td>
</tr>
</tbody>
</table>

Additional funding was provided for $0.7 billion for investment projects, $0.9 billion for non-investment technical assistance, and $103 million for additional Bank financing. This article was prepared by Anjali Acharya, (202) 458-5298, and Rita Lohani, (202) 473-2646, fax (202) 477-0565, of the Environment Department, with inputs from the Environment Strategy Team. Environment Strategy website: <www.worldbank.org/environmentstrategy>.
The main themes of Environment Matters 2003 are particularly relevant in Sub-Saharan Africa. Water scarcity is a key constraint to improving health and production, while biodiversity assets represent a principal basis for existing livelihoods and future economic development.

The Bank’s Africa Region Environment Strategy (ARES) seeks to support environmentally sustainable development by integrating environment into the strategies and programs that are considered priorities by African stakeholders and their development partners. Africa Region activities during fiscal 2003 reflected ARES priorities, such as poverty/environment linkages; water resource management; fragile and marginal lands; community management of natural resources; protected areas within a broad ecological, social, and economic context; and environmental capacity building.

Capturing poverty/environment linkages

Poverty alleviation continues to be the core mission of the World Bank and a central concern of our clients. Clarifying and addressing environment/poverty linkages is a top priority. New instruments—such as Poverty Reduction Strategy Papers (PRSPs) and Poverty Reduction Strategy Credits (PRSCs)—are increasingly setting the development agenda and serving as a main channel for World Bank assistance. Mainstreaming environment in this context begins with improving poverty assessment, analysis, and monitoring. For example, in Nigeria an analysis of poverty/natural resource linkages in rural household surveys has contributed to a better understanding of the sources and implications of rural poverty. In Uganda and Tanzania, environmental sustainability and management capacity are being built across all sectors, with special emphasis on poverty-environment
highly dependent on rainfed agriculture, African economies and livelihoods are improving environmental management and in-country capacity. In the successful “Working for Water” program in South Africa, national poverty reduction funds pay for removing water-hungry alien vegetation from important watershed areas. Economic analysis can help justify payment by demonstrating the importance of these ecosystem services (see Box on Madagascar, below).

Sustainable livelihoods and conflict management on fragile lands

In Africa, 180 million people (39 percent of the population) live on fragile drylands where growing numbers of pastoralists and agriculturalists increasingly compete for water and land. Government policies have typically encouraged agricultural expansion and undermined the livelihoods of the pastoralists. However, mobile pastoralist systems are known to be a very efficient form of land use in arid tropical regions. The Bank is supporting

**LINKING ENVIRONMENT AND POVERTY REDUCTION IN MADAGASCAR**

Madagascar has been locked in a downward spiral of poverty and environmental degradation, including a 35 percent decline in GDP per capita and the loss of almost half its forest area over the past 40 years. Forest destruction has undermined watersheds and soil stability vital to the agrarian economy, with losses of up to 150–200 metric tons of topsoil/hectare/year, and has caused siltation and water shortages in dams and irrigation systems.

A recent Bank report showed that the economic benefits of biodiversity conservation far outweigh costs in Madagascar. Sustainable management of a network of 2.2 million hectares of forests and protected areas over a 15-year period would cost $97 million (including opportunity costs of foregone agricultural expansion). The total benefits are estimated at $117 million, made up of direct payments for biodiversity conservation (15 percent), ecotourism revenues (45 percent), and watershed protection (40 percent), primarily from averting the impacts of soil erosion on smallholder-irrigated rice production on 200,000 hectares and improving the quality of 14 million cubic meters of water. Recognizing that there are winners and losers from forest conservation, the study notes the need for equitable transfer mechanisms to close this gap, but emphasizes that conservation will help maintain or improve the welfare of at least half a million poor peasants.
ecosystem management approaches and conflict reduction through jointly agreed sustainable land management plans in projects such as the Niger Community Action Program, the Ghana Northern Savannah Biodiversity Conservation Project, the Tanzania Forest Conservation and Management Project, and the Burkina Sahel Integrated Lowland Ecosystem Management Project (see Box on Drylands, below). In the Ghana project and the Ethiopia Conservation and Sustainable Use of Medicinal Plants Project, the Bank is also helping to mobilize indigenous knowledge to manage these environments.

**Managing Conflict Over Land and Natural Resources in Africa’s Drylands**

In Nigeria, continuous conflict over natural resources by many rural stakeholders is aggravated by unclear and insecure property rights, inequitable access to resources and lack of transparency, and weak conflict resolution mechanisms. The FADAMA II project aims to mainstream conflict resolution processes within the preparation and implementation of community Local Development Plans. The objective is to maintain ecosystems (wetlands, riverine forests, groundwater resources, and biodiversity), which are critical to the sustainability of the *fadam* agricultural resource base, as well as conserve biodiversity benefits of regional and global significance.

The Northern Savannah Biodiversity Conservation Project in Ghana aims to improve the livelihood and health of local communities, support the sustainable use of natural resources, including medicinal plants, and manage conflict over these resources among different communities (farmers, herders, hunters, etc.) and with reserve authorities. The project will help establish a conflict resolution and management system that will allow community access to resources. It will also deal with human/wildlife conflict in transfrontier corridors that connect two protected areas.

**Community-based natural resource management (CBNRM)**

The Bank is supporting many CBNRM projects that reinforce common property management systems and strengthen land tenure. This is done for rural households and communities throughout the region as part of the Bank’s overall support for decentralization and democratization. For example, a Bank/GEF-supported project—the Integrated Ecosystem Management Project in Namibia—will support the expanding community conservancy network in the country.

Community-driven development (CDD) projects provide financing and technical assistance directly to communities. New CDD projects increasingly include investment in sustainable livelihoods and natural resource management (NRM) in addition to building traditional social infrastructure (see Box on community-driven development, below).

The Bank supports numerous CBNRM projects aimed at empowering communities to manage forest resources effectively and sustainably. However, success depends on a supportive policy and institutional environment, as illustrated in Cameroon and Gabon, where forest and environment sector programs aim to address these issues to help preserve some of the largest remaining tropical forests in the world (see Box on Cameroon at top of next page).

**Capacity building for environmental management**

As budget support credit and programmatic instruments become more frequent, strengthening the relatively weak environmental institutions and Environmental Assessment (EA) capacity in Africa is becoming all the more urgent. The Bank is working with African EA stakeholder groups to develop a new strategic framework with elements that include strengthening an emerging network of EA practitioners; increasing borrower institutional capacity to manage EA programs; extending regional training and learning-by-doing programs; and build-

**Mainstreaming Environment in Community-Driven Development**

The pastoralist population of arid northern Kenya is vulnerable to frequent, acute food insecurity related to drought. The Kenya Arid Lands Resource Management project aims to help them help themselves break out of the prevailing survival/relief cycle. The first phase of the project covered nine districts and focused on improving crop and livestock resilience to drought, developing a drought preparedness strategy, and improving basic health and water services for the mobile population. The recently approved second phase will expand the program to more communities. It will continue to use a CDD approach and seek to enhance NRM activities.

The Burkina Faso Community-Based Rural Development (CBRD) Project is a three-phase, 15-year Adaptable Program Loan (APL) that helps to support a national CDD program. The complementary GEF-financed Sahel Integrated Lowland Ecosystem Management Project, also a 15-year APL, will strengthen local capacity, policies, and implementation resources for integrated ecosystem management. The CBRD will finance community initiatives with local benefits (such as soil and water conservation, reforestation, and renewable energy), while the SILEM will provide incremental funding for activities with national and global environmental benefits (such as zero tillage, organic fertilizer, agro-biodiversity crop seed production, and biodiversity-based enterprises such as cultivation of medicinal plants).
IMPROVING GOVERNANCE IN THE FOREST SECTOR IN CAMEROON

Cameroon is Africa's largest wood exporter and home to some of the region's richest biodiversity. Historically, logging has been poorly managed and regulated, has imperiled rare wildlife and the ecological integrity of the forest, and yielded little benefit for local communities and governments. In 1994, a new forestry law, enacted as part of a Bank structural adjustment credit condition, met considerable opposition. Local support gradually increased thanks to a growing constituency of government reformers and positive results at the community level. A second structural adjustment operation further supported forest sector reform, including disclosure of concession details in local newspapers, use of independent (Cameroonian and international) observers, and satellite imagery to monitor concessionaire compliance. Global Forest Watch Cameroon reported more transparent concession allocations in the June 2000 round. Annual fees have increased from $0.14 to $6 per hectare, with the total value of contracts expected to reach $600 million over the 30-year forest management period. A new legal framework for community forestry gives communities priority access to forestland. Further, new protected areas have been created, short-term speculators are being replaced by long-term investors, and local communities' revenues have increased from negligible levels in 1998 to $8 million in 2002.

Protected areas in context

Protected areas (PAs) are increasingly being viewed within a larger ecological and social/economic context. The Bank's strategy for PAs includes an ecosystem management approach, including transfrontier conservation areas, community-based conservation, mobilization of economic benefits through nature-based tourism, and community/private sector partnerships. The rapidly growing tourism industry and high-level political commitment to transborder cooperation provide rich opportunities in Southern Africa (see Box, below).

SUSTAINABLE TOURISM IN SOUTHERN AFRICA

Southern Africa offers a unique opportunity for "win-win" solutions linking sustainable economic development with biodiversity conservation and environmental management through tourism. Tourism rates and investment in the area are growing rapidly, particularly for "bush and beach" packages that depend on healthy natural ecosystems and abundant wildlife. The Bank and other development partners are assisting southern African countries to create a diverse and integrated regional tourism circuit to rival any tourism attraction in the world. To ensure environmental sustainability and poverty alleviation impacts, the emphasis is on spatial planning and management at an ecosystem level and on community participation and benefits.

The multi-phase, multi-donor Mozambique Transfrontier Conservation Areas (TFCA) Program builds on the fact that Mozambique has large areas of rich biodiversity adjacent to well-established conservation and tourism areas in neighboring countries. The first phase, a GEF-financed project laid the political and institutional groundwork. The second phase, to be supported by IDA, GEF, and bilateral partners, will focus on TFCA (including embedded Protected Areas) and tourism development. The Mozambique Coastal and Marine Biodiversity Management Project supports the crucial "beach" element by promoting environmentally and socially sound tourism in the context of integrated coastal zone management. The Swaziland Biodiversity Conservation and Participatory Development Project will provide support for participatory spatial planning within two broad "tourism and biodiversity" corridors whose endpoints fall within transfrontier conservation areas. The proposed IFC South East African Integrated Tourism Investment Program will support tourism investments based on environmental sustainability and partnership with local communities.

At the end of June 2003 the active portfolio of World Bank environmental lending in the Africa Region was $1.3 billion. In fiscal 2003, the total environmental lending amounted to $227 million.

This article was prepared by Agi Kiss, 1(202) 458-7180, fax (202) 473-8185, of the Environmentally and Socially Sustainable Development Unit for Southern Africa. AFR website: <http://www.worldbank.org/afri>.
East Asia’s remarkable growth over the last three decades is in part due to its copious and diverse natural resources. But growth (and poverty reduction) has been accompanied by serious environmental costs. Maintaining sustained economic growth remains dependent on natural resources and needs to be based on better attention to and better husbandry of the region’s remaining resource base. For East Asia to continue putting emphasis on the quality of growth rather than on its magnitude, it should continue promoting opportunities for local community involvement and participation in environmental protection and management of natural resources; increase investments that will improve environmental quality in Asian megacities and other urban areas through reductions in air and solid waste pollution; and, especially, give priority to the development and management of water resources across the region.

Water — An important regional resource

East Asia’s dynamic growth—characterized by rapid increase in GDP and population and by migration from rural to urban areas—is severely stressing urban water supply and sanitation (WSS) systems, increasing competition for surface and groundwater resources, endangering water quality, and creating conditions of water scarcity in some areas. Irrigation accounts for some 85 percent of freshwater withdrawals. The large-scale irrigation schemes implemented during the Green Revolution are inefficient, delivering as little as 40 percent of water to crops. Subsidies exacerbate the problem by encouraging the expansion of inefficient supply systems and by discouraging demand-side behavior that would improve water delivery services.
The development of water resources, accompanied by extensive deforestation and other factors, has disrupted the full spectrum of freshwater ecosystem services. Many regions are characterized by reduced stream water levels, lowered water tables, degraded riparian wetlands, diminished freshwater aquatic diversity, and increased flood damage. Excessive demand for groundwater in cities such as Bangkok, Jakarta, and Manila has led to saline intrusion and ground subsidence.

Water quality is declining due to increasing industrial and urban pollution. It has been estimated that more than 500,000 infants die each year in the region as a result of waterborne diseases linked to dirty water. About 60 percent of these deaths are a consequence of the deficit in rural water supplies, while another 30 percent are due to the lack of sanitation in urban areas. Furthermore, most households without access to safe water pay up to 10 percent of their annual income for this water, often more than the cost of providing piped or boiled water. The health benefits of providing clean water are significant.

Coastal ecosystems and fisheries also are under increasing pressure. The productivity of many fisheries is declining, largely as a result of overharvesting. Other significant trends include destructive fishing, reduced access of traditional users to fishing grounds, and potential damage to tropical marine ecosystems from rising sea levels.

The recently completed East Asia Water Resources Management Strategy aims to achieve consistency between EAP water resources programs and projects, the Bank’s 1993 Water Resources Management Policy (WRMP), and its new 2003 Water Resources Sector Strategy. The East Asia Strategy recognizes that the principles articulated in the WRMP remain valid and emphasizes the need for a more holistic approach to water resources management (WRM) throughout the region. The Strategy states that water resources management must deal with (a) the institutional framework; (b) management instruments; (c) development and management of infrastructure; and (d) the political economy of water management and reforms. Individual Country Water Resources Strategies will provide an overall vision and framework to facilitate achieving sustainable integrated management of water resources throughout the region. To date, a strategy for China has already been completed, and strategies for Cambodia and the Philippines are under preparation. In addition, the Mekong River Commission (MRC), an intergovernmental body established in 1995 by the governments of Cambodia, Lao PDR, Thailand, and Vietnam, promotes and coordinates the use, management, and conservation of the water and related resources of the Mekong River Basin (MRB). The World Bank is engaged with the MRC through a GEF-financed Water Utilization Project, which is helping establish a database and regulations for effective, collective decisionmaking on water-related issues in the

**East Asia and the Global Environment**

**Ozone Depleting Substances (ODS).** The East Asia ODS program is the largest in the world, with current commitments of approximately $590 million. The region intends to phase out consumption and production of 235,723 MT of ODS by 2010, accounting for nearly 75 percent of the remaining ODS production in all developing countries. There are currently operational programs in five countries, with the largest program in China focusing on both ODS production and consumption. China’s Mobile Air Conditioning Sector Plan was the first such plan to be completed in the Bank’s ODS Program. National chlorofluorocarbon phaseout plans (NCPDs) are under implementation in Thailand and Malaysia; a NCPP has been approved for the Philippines, along with a Mobile Air Conditioning Sector Plan for Indonesia; and a NCPP is being developed for Vietnam.

**Carbon Finance.** In the climate change area, the Bank is building on the achievements under the GEF portfolio to assist project entities to access financing through the windows available under the Prototype Carbon Fund and other carbon finance windows that have become operational. Proposals for projects in energy efficiency and solid waste management are currently being formulated in China, Indonesia, Philippines, and Vietnam.

**Persistent Organic Pollutants (POPs).** Currently, China is the only country in the region with an active POPs program. It includes three pilot activities: 1) a toxicity study on health effects on women and children; 2) a termite study; and 3) a polychlorinated biphenols management capacity building project. Based on the results of the pilot activities, GEF-financed full-size demonstration projects will be launched in China in the next fiscal year.

**The Global Environment Facility.** The region’s GEF portfolio has grown to 36 projects, of which 21 are full-sized projects (FSPs) and 15 are medium-sized (MSPs). Out of these 36 projects, 12 FSPs and 3 MSPs address climate change and 8 FSPs and 11 MSPs address biodiversity conservation. In FY03, the Region delivered 4 pipeline entries, 3 Council approvals, and only 2 Board approvals, largely due to the impact of SARS on project processing schedules.

**The Clean Air Initiative (CAI).** Since its inception in 2001, CAI continues to advance innovative ways to improve air quality in cities by sharing knowledge and experience through partnerships in selected countries of the region. Over the last year, CAI brought together a range of cross-cutting expertise in urban development, transport, energy reform, environmental management, and environmental health for Asian cities to implement successfully a wide range of activities.
Strategies, poverty reduction programs, and partnerships. Specifically, EASES:

- Initiated research to broaden and strengthen our understanding of poverty/environment linkages in Cambodia, Lao PDR, Vietnam, and China; helped equip client countries with state-of-the-art knowledge on poverty/environment linkages; and assisted countries with analytical activities in this area, particularly in connection with the preparation of PRSPs for Cambodia, Lao PDR, Indonesia, and Mongolia.

- Strengthened strategic country and sectoral environmental analysis to explore key environmental challenges, their linkages to development objectives and policy changes, and the institutional capacity of countries to address their priorities. Environment Monitors have been completed for the majority of EAP countries, and a regional environmental monitor is currently under preparation.

- Provided technical assistance, knowledge, and learning programs to support policy innovations in industrial pollution abatement, developed indicators and programs to meet the Millennium Development Goals (MDGs), and addressed complex cross-sectoral issues such as urban air quality and environmental management.

- Fostered environmental partnerships to address problems pertaining to environment and natural resources management more effectively. Successful, ongoing environmental partnerships include the World Bank–WWF Forest Alliance, the World Bank–Nature Council–Birdlife International for biodiversity, the World Bank–Korea Knowledge Partnership, the Thailand Country Development Partner-

MRB. The World Bank support to the MRC is seen as critical to achieving the long-term objectives of the Commission.

EAP has a large and diverse portfolio of water-related projects, which account for some 22 percent of all lending in the Region for the period 1992–2002. Of particular importance are the investments in hydropower and flood control and those addressing the challenges of development regulations and instruments for better economic, environmental, and social management of water resources. Examples include the Indonesia Water Resources and Irrigation Sector Management Project, the GEF Mekong River Commission Water Utilization Project, and the China Tarim II Basin Project.

Mainstreaming environment

In fiscal 2003, EAP’s Environment and Social Development Unit (EASES) also continued mainstreaming environment into policy dialogues, Country Assistance
ship, and ongoing work with major faiths in the region to show the strong links between religious beliefs and practices and environmental stewardship.

At the end of fiscal 2003, the regional program appeared highly mainstreamed. EASES only delivered 4 percent of total environmental assistance, with the remaining 96 percent provided primarily through the Rural Development and Natural Resources Sector Unit, the Urban Development Unit, and the Energy and Mining Sector Unit. The regional environmental portfolio comprised 94 projects (stand alone and mainstreamed) representing a total commitment of $10.6 billion in both loans and grants. Of this, the value of investments for environmental activities amounted to approximately $5.2 billion (55 percent of the total), which is the highest in both absolute and proportional terms of any Region in the Bank. China accounted for nearly 85 percent of the total value of the regional investment program; its 53 projects amount to a total investment value of approximately $8.9 billion, of which $4.9 billion (55 percent) is for environmental purposes. Thematically, about 30 percent of total environmental investment deals with climate change. An additional 25 percent focuses on pollution management, mainly through the large urban environmental program, and 17 percent deals with water resources management, representing a combination of river basin management projects in the rural portfolio and some urban environmental investments.

Total investment in other EAP countries amounted to approximately $1.6 billion, of which about $0.8 billion (48 percent) was for environmental purposes. The thematic distribution of environmental investments focused on biodiversity and policies and institutions, less on pollution management, and varied significantly across countries, thus reflecting differences in financial absorptive capacity. Country programs in which environmental assistance was quite substantial included Indonesia (74 percent of total assistance devoted to environmental purposes), the Philippines (55 percent), and Cambodia (48 percent). The level of environmental investment in Vietnam was low (32 percent) and quite inconsistent with both the scale and importance of environmental problems in that country and its awareness and assimilative capacity.

EASES plans to continue supporting client countries by implementing policies and programs that distribute the gains of development in a more equitable manner, avoid unnecessary impacts on the environment, and build on the emerging global consensus that natural resources and other environmental assets must be managed sustainably.

Note: 1. The data on the size and content of the EAP regional environmental portfolio are consistent with a separate portfolio analysis conducted in 2002 by the Environment Department, following the introduction of new sectoral and thematic project classification codes.

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Significant progress has been made over the past decade to improve environmental quality in the Europe and Central Asia (ECA) Region. Energy efficiency increased 35 percent since 1992 and carbon dioxide (CO₂) emissions declined 27 percent from 1992 to 1999. While the economic collapse in the region is largely responsible for these improvements, many countries have implemented structural changes and restored GDP growth without increased pollution.

Water quality also has improved in the region. For example, water supply rehabilitation in small cities and rural settlements in Kazakhstan improved health and sanitation for 10 percent of the population. Institutional and pricing reforms in the Baltic States have led to water conservation and reduced pollution. Many activities are also under way to improve and safeguard the Aral, Baltic, Black, and Caspian Seas.

Forested areas in ECA have increased significantly as a result of greater forest certification, adoption of fees for felling of trees, and improved fire and pest management. Compared with 1990, about 500,000 hectares of forest are now better managed. Efforts are under way to establish an additional 800,000 hectares of protected areas.

The region has also made progress in tackling global environmental problems, notably the successful phasing out of ozone-depleting substances in selected countries. Emissions trading in carbon rights are also starting to take hold, which should help to address another global environmental challenge, climate change.

**Many challenges remain...**

Despite achievements that have been made over the past decade, many challenges remain. Considerable scope exists for increasing energy efficiency and further reducing CO₂ emis-
sions. Hazardous industrial hotspots and waste management also continue to pose a significant threat.

Overall, more emphasis is needed on structural reforms to protect the environment. The phasing out or elimination of subsidies, installation of meters to improve collection and cost recovery for energy and water utilities, and privatization of consumer and industrial sectors would contribute significantly to promoting environmental sustainability.

Major efforts are needed in the area of institutional reforms, including strengthening the legal basis for environmental management; increasing monitoring and collection of data to guide decisionmaking; and improving public participation and access to information. Above all, there is a need to strengthen the capacity of environmental ministries and develop horizontal links with other ministries responsible for water, sanitation, energy, forestry, and biodiversity.

**Water... a particularly pressing issue**

Most serious in terms of health and poverty linkages in ECA is ensuring access to clean and affordable drinking water and sanitation and safeguarding water resources. Investment in water infrastructure is vital to protect against droughts and floods, produce energy, and support agriculture to ensure economic growth.

**Water supply and sanitation.** Despite statistics indicating high levels (91 percent) of access to improved water supply (see Figure at right), systems throughout ECA are in disrepair due to lack of maintenance, poor planning, low-quality construction, and overemphasis on capacity expansion. Water losses from networks are as high as 50 percent in some cases. Regulations impose unaffordable technical standards. Financial performance and cost recovery measures are undermined by inefficient cross-subsidy policies, non-payment, barter, and political influence in tariff setting.

The high reported access rates also do not reflect the fact that only 30 percent of rural households receive piped water. Furthermore, the serious issue of water quality, especially in rural areas, is not apparent from the data. In Moldova, for example, 60 percent of water samples in rural areas do not meet biological or chemical standards.

The level of access to basic sanitation is also officially quite high at 93 percent. Again, however, these data do not reflect the serious state of disrepair of many sewage systems. For example, in Ukraine, about 23 percent of water pipelines and 25 percent of sewage treatment systems need urgent rehabilitation. The situation in rural areas in the region is significantly worse. It is estimated that 25 percent of annual deaths of children under age five in ECA can be prevented by providing universal access to sanitation.

The costs of meeting the water supply and sanitation MDG targets in CIS countries will be considerable. In a Bank report entitled "Meeting the Environment Millennium Development Goal in ECA," it was estimated that CIS countries alone will have to spend $1.1 billion per year to meet the water and sanitation 2015 targets, considerably more than current investment. Candidate countries seeking to gain access to the European Union also face high costs to comply with the EU's environmental component of the **acquis communautaire** (see Box, top left on page 46).

**Access to improved water source**

![Graph showing access to improved water source](image)

In 2002, accession candidate countries adopted the EU’s *acquis communautaire*. Meeting the environmental directives will bring considerable improvements in quality of life, with total benefit estimates ranging from €103 to €531 billion. Some of the greatest benefits, estimated to range from €43 to €98 billion (2005 to 2020), will come from meeting EU water directives.

The benefits of meeting EU environmental standards will come at a cost. Approximately €110–€116 billion will be needed over a period of some 20 years, representing anywhere from 23 to 134 percent of countries’ present GDP. Meeting the EU water supply, and particularly wastewater directives, alone will require investment of about €51 billion.

For all countries (see table), the ratio of benefits to costs to meet water supply directives is greater than 1 under a high scenario. Careful case-by-case assessments are needed, however, since these figures do not reflect the fact that the costs of some investments may exceed potential benefits.

While large levels of investment are crucial, they will be ineffectual without stronger environmental institutions and legal frameworks that are harmonized with those of the EU. Building this institutional and legal base could considerably prolong the time needed to meet environmental directives.


<table>
<thead>
<tr>
<th>Country</th>
<th>Low</th>
<th>High</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bulgaria</td>
<td>0.73</td>
<td>1.94</td>
</tr>
<tr>
<td>Czech Republic</td>
<td>10.43</td>
<td>16.48</td>
</tr>
<tr>
<td>Estonia</td>
<td>0.39</td>
<td>1.48</td>
</tr>
<tr>
<td>Hungary</td>
<td>0.93</td>
<td>3.59</td>
</tr>
<tr>
<td>Latvia</td>
<td>0.50</td>
<td>1.77</td>
</tr>
<tr>
<td>Lithuania</td>
<td>1.17</td>
<td>2.61</td>
</tr>
<tr>
<td>Poland</td>
<td>1.70</td>
<td>3.99</td>
</tr>
<tr>
<td>Romania</td>
<td>0.89</td>
<td>2.72</td>
</tr>
<tr>
<td>Slovak Republic</td>
<td>3.57</td>
<td>7.87</td>
</tr>
<tr>
<td>Slovenia</td>
<td>n.a.</td>
<td>n.a.</td>
</tr>
<tr>
<td>Total</td>
<td>1.94</td>
<td>4.39</td>
</tr>
</tbody>
</table>

Water-related lending

As of June 2003, 63 water-related projects (including GEF) were under implementation in ECA, totaling $1.96 billion in lending to 22 countries. This represents 15 percent of total project lending ($6.4 billion) of the Region.

The majority of water-related lending is for water supply and sanitation or for water resources management (see Figure, bottom of page 47). Over 75 percent of WSS projects focus on urban areas. The high percentage of WRM lending may be somewhat misleading, since it includes two flood emergency projects in Poland and Turkey that total $569 million.

GEF projects address municipal, industrial, and agricultural pollution currently degrading the Black and Baltic Seas, as well as waterlogging and salinization problems in the Aral Sea Basin. The Bank...
also executes part of the GEF-UNDP-funded Caspian Environment Program.

**New projects approved in 2003.** A total of 10 new water-related projects worth $194 million (including GEF) were approved in 2003, representing 52 percent of all new environment-related project lending. Of these, three were for WSS, three for irrigation and drainage, one for hydropower and two (described below) for water quality improvement.

- A new project in northeastern Kazakhstan will remove serious mercury pollution in the Nura River to provide a safe, secure, and cost-effective alternative source of water supply to meet the needs of local water users in the area, particularly the residents of the capital city of Astana.

- The GEF Baltic Sea Regional Project (Phase 1) aims to address the three main threats to the Sea: excessive nutrient loads, industrial contamination, and overexploitation of marine resources. The focus will be on reducing nutrient runoff from farms, coastal zone management, sustainable use of fisheries, and improved government decision-making.

**Projects under preparation.** ECA’s water-related pipeline includes $926 million for 41 projects (including GEF). Four new WSS projects, mainly urban-focused, are under preparation in Armenia, Croatia, Georgia, and Kazakhstan. Two new watershed management projects are planned for Tajikistan and Turkey, as well as irrigation projects for Albania, Romania, Turkey, and Uzbekistan. In Romania, a flood hazard project is being prepared to develop better dam management and emergency response capacity.

At the end of June 2003 the active portfolio of World Bank environmental lending in the ECA Region was $1.5 billion. In fiscal 2003, new total environmental lending amounted to $123 million.

**Looking forward...**

In the coming year, the Bank aims to increase its involvement in water-related activities to assist ECA countries toward their goals of meeting the MDGs, and in the case of accession candidate countries, EU water-related directives. It will aim to focus more on rural areas where WSS services have been neglected and where action can have a significant impact on reducing poverty and addressing health concerns.

Helping countries to meet the MDGs will also require improving data reliability and establishing clear baselines and concrete targets. The Bank plans to undertake work to identify ways to improve data quality in ECA, especially in environmental health.

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he Latin America and Caribbean Region (LCR) continues to face environmental and natural resource pressures due to population growth, rising income inequality, and dependence on the exploitation of natural resources. Of the 418 million hectares of natural forest lost worldwide over the past 30 years, more than 40 percent was in Latin America. In Brazil, deforestation has reached its highest rate since 1995, with an area slightly smaller than Haiti deforested between 2001 and 2002. Urban environmental problems, especially air pollution, water contamination, and inadequate waste disposal, are having severe health impacts on the 75 percent of the region’s population that lives in cities.

In fiscal 2003, the World Bank’s Latin America and Caribbean Regional Office continued to respond to these challenges through implementation of its 2002–06 Environment Strategy, which seeks to align environmental concerns with other sectoral strategies, such as rural, urban transport, and energy. The Strategy focuses on the most critical environmental problems in the region, including urban and industrial pollution, mismanagement of natural resources, threats to biodiversity, and climate change. By addressing these problems, LCR is moving forward in its achievement of the Strategy’s objectives of improving health, developing frameworks for sound environmental management, enhancing livelihoods, and facilitating equitable solutions to regional and global challenges.

Environment

In Argentina, Colombia, and the eastern Caribbean, LCR supported projects that increased access to safe water, solid waste collection, and sanitation systems. In addition, projects in Chile, Colombia, Mexico, and Peru are providing more efficient and sustainable urban mass transit systems, and the Clean Air Initiative in Latin American Cities supported improvements in air quality.
Indoor air pollution in Guatemala is closely linked with the well-being of children and women, mainly in poor, rural indigenous households. Eliminating indoor pollution in the country's rural highlands could reduce acute respiratory infections in children under the age of five by as many as 16,000 cases and could prevent 700 deaths per year. A recent ESMAP-funded study quantified the health impacts of traditional fuel use in Guatemala and outlined strategies and policies for mitigating those effects. The study recommended (a) monitoring indoor air pollution to better understand its health impacts and build support for addressing the issue; (b) improving coordination among the government agencies and jurisdictions responsible for mitigating those impacts; (c) building public awareness; and (d) implementing mitigation options, such as better ventilation, improved stoves, and cleaner fuels. The study proposed that incentives be tailored to make existing initiatives, such as the Social Investment Fund’s improved stove program, more effective.

Water quality, sanitation, and biodiversity protection in Colombia were improved through the Santa Fe Water Supply and Sewerage Rehabilitation Project, which received a Green Award from the Bank’s Environment Department for its success in mainstreaming environmental considerations. The project has helped Bogotá’s water utility expand services to the urban poor and address major environmental concerns through sewage control and restoration of a once extensive wetland system. Public health has been improved through construction of 670 kilometers of aqueducts, 120 kilometers of sewerage canals, and 23 kilometers of storm canals and through installation of 46,254 household water and 23,830 sewerage connections in poor neighborhoods. Approximately 770 hectares of highly degraded wetlands were restored to provide valuable habitat, environmental services, and even recreational opportunities.

Solid waste management was improved in six eastern Caribbean countries through a project that enhanced the coverage and effectiveness of waste collection, treatment, and disposal. The project helped eliminate open, informal garbage dumps and reduce waste from cruise ships that polluted coastal waters and beaches. It also helped establish new solid waste management entities, private-sector collection services, sanitary landfills, and successful cost-recovery mechanisms. These innovative mechanisms include a tourism levy, environmental taxes, and household service charges linked to electricity and water consumption. In addition, all six countries have developed or already enacted new solid waste legislation, started basic environmental education programs to increase public awareness, and implemented specific waste reduction initiatives.

**Promoting environmentally appropriate policies and instruments**

Sound environmental management requires an appropriate enabling environment, one with a strong institutional framework and legal foundation as well as effective environmental instruments. In fiscal 2003, LCR directly promoted more effective policies, instruments, and institutions in Mexico, Brazil, Colombia, the Dominican Republic, and other countries. For example, the Bank supported the first stage of the Mexican government’s program to decentralize environmental management and mainstream environment in key economic sectors, namely water, forestry, energy, and tourism (see Box).

Under the Second National Environment Project in Brazil, matching grants for environmental investments (environment asset subprojects) have been provided to states that have completed a priority-setting exercise and demonstrated compliance with policy reforms. Nearly all the states have qualified for various stages of financial incentives that encourage them to make policy reforms in the key areas of environmental management that they select. Solid waste management has been the environmental issue most frequently identified as a high priority by the states. Under the project, a dozen states have formulated solid waste management policies and seven states have

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**MAINSTREAMING ENVIRONMENT AND DECENTRALIZING MANAGEMENT FUNCTIONS IN MEXICO**

The Mexico Programmatic Environment Structural Adjustment Loan was recognized this year for its promotion of environmental mainstreaming with a Green Award from the Bank’s Environment Department. In less than a year, this loan—the first of its kind in LCR—has helped:

- Define and publicly disclose measurable medium-term targets in the water, forestry, energy, and tourism sectors
- Establish intersectoral technical working groups to promote environmental mainstreaming and alignment of sectoral agendas
- Increase municipal payments of water fees to cover 58 percent of municipal water use in 2002, compared with 24 percent in 2001
- Increase marine park revenues 200-fold by collecting user fees and earmarking this revenue for reinvestment in protected areas
- Attain quality certification (ISO9001) as part of the decentralization of environmental functions from the federal to the state level
- Obtain federal grants to finance capacity building in at least 10 states, so they can assume environmental management functions
- Publicly disclose, on a pilot basis, processing information for certain Environmental Impact Assessments and permits through the environment ministry’s website <www.semarnat.gob.mx>.
Improving livelihoods

Efforts to improve livelihoods are underway in Colombia, Costa Rica, Mexico, Nicaragua, and Panama through the adoption of sustainable environmental management practices that address degradation and resource depletion by means of community-based approaches and strategic implementation tools such as property rights and appropriate technology.

In Mexico, some 8,000 forest ejidos and indigenous communities own approximately 70 percent of the country’s 55 million hectares of forest. This extensive communal ownership poses important challenges for the sustainable development and conservation of forest reserves, and requires unique solutions. The Community Forestry Project has helped many indigenous communities and ejidos in Mexico to better manage their forest resources while strengthening social capital and increasing community incomes. The project has helped improve management of 166,000 hectares of forest, promoted land-use planning for 117,000 hectares of noncommercial forest, placed 13,700 hectares of forest in conservation, and generated economic activity that has created 1,500 permanent new jobs.

In Colombia, Costa Rica, and Nicaragua, deforestation has largely been a function of poverty, unemployment, and inequitable land distribution that encourages the landless poor to clear tropical forests for subsistence farming. In many areas this practice is unsustainable, eventually leading to loss not only of livelihoods but also environmental services such as carbon sequestration, watershed protection, and habitats for biodiversity. Under the Silvopastoral Integrated Ecosystem Management Project, farmers in these countries are given incentives (payments for certain environmental services) to convert degraded pastures into land with more diverse vegetation that to a large extent mimics forest ecosystems. Recent socioeconomic surveys indicate that farmers are pleased with the payments and technical assistance received under the program. Anticipated benefits from the project include reduced erosion, improved soil and water quality, and greater productive capacity of the degraded lands, consequently increasing income and employment.

Environmental considerations are being incorporated into a large-scale, area-based land tenure regularization system under the Nicaragua Land Administration Project. Under the project, approximately 10 indigenous communities on the Atlantic Coast are being demarcated, which will have a favorable impact on some 26,000 indigenous peoples living in an area of 1.4 million hectares. These indigenous groups represent the poorest in Nicaragua, who lack clear property rights and whose lands have been encroached upon by commercial logging, mining, and livestock operations.

Promoting solutions to global environmental challenges

To harmonize both global and local agendas, LCR continues to help countries address climate change by mitigating greenhouse gas emissions, protecting the carbon sequestration functions of forests and rangelands, promoting renewable energy options, and facilitating participation in international carbon markets. The region boasts the largest Prototype Carbon Fund (PCF) portfolio in the Bank, with projects in Colombia, Chile, Brazil, and Costa Rica representing an estimated reduction of more than 17 million tons of CO₂ over a 21-year crediting period. Efforts to mitigate greenhouse gases are also underway in Mexico, where in just a year’s time the Methane Capture and Use Project is recovering enough landfill gas in Monterrey to provide power to a 7-megawatt plant that is used to operate...
the city’s subway system during the day and light the city at night.

One of the PCF projects, the Colombia Jepirachi Carbon Offset Project, is supporting greenhouse gas emission reductions in the power sector through a 19.5-megawatt wind-based electricity generating facility. By supplying emission reductions, the project—the first carbon finance project for wind in the region—also helps develop the international carbon market under the Kyoto Protocol’s Clean Development Mechanism. It is anticipated that the PCF will purchase up to 800,000 tons of CO₂ equivalent worth $3.2 million. The project is also supporting local development activities by providing the Wayuu Indians with improved access to potable water (produced by a wind-powered desalination plant), health services (solar-powered), education facilities, and community strengthening measures.

LCR also supports conservation of ecosystems critical to biodiversity and reduction of deforestation rates in Latin America, which are among the highest in the world. A flagship of this effort is the Brazilian government’s Amazon Region Protected Areas Initiative (see Box). In Bolivia, the Sustainable National System of Protected Areas Project is helping to develop various financing mechanisms and to strengthen management capacity in targeted protected areas. The project is implementing market-based cost recovery mechanisms such as park entrance fees, 25 percent of which are currently directed toward community development projects. In addition, a trust fund developed under the project has raised $17 million and provides financing for 40 percent of the system’s recurrent costs, already exceeding end-of-project targets.

In Brazil, efforts are under way to improve biodiversity conservation and sustainability by developing a long-term sustainable financing mechanism and promoting partnerships with government agencies, nonprofit organizations, academic institutions, and the private sector. Since inception, the Brazil Global Environment Facility FUNBIO Project has leveraged more than $5 million in private-sector funding, established important partnerships (with the Ford Foundation, Fundación Rureco, Instituto Terra, and others), and actively engaged a diverse range of experts.

In Mexico, Belize, Guatemala, and Honduras, the Mesoamerican Barrier Reef System Project (MBRS) is addressing issues related to conservation of valuable transboundary ecosystem services and resources. The MBRS has established National Barrier Reef Committees to reflect diverse stakeholder interests in each country and has supported transboundary commissions to address marine resource management concerns in border areas. The project has also trained managers of protected areas in how to design participatory management plans and has developed a regional protocol to monitor ecosystem health. To relieve pressure on marine protected areas, training has been provided to fishers on alternative livelihoods and to small and medium-size enterprises in the tourism and fisheries sectors on sea kayaking, recreational diving, and catch-and-release sport fishing. Best practices are also being implemented through establishment of a regional tourism forum and development of a regional certification system for marine-based tourism enterprises.

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he Middle East and North Africa (MNA) Region is assisting its clients in meeting the Millennium Development Goals. However, while the incidence of abject poverty in MNA remains low, the percentage of people with income of less than $2 a day has grown over the past five years as regional economies remain stagnant. Increasing water scarcity and land degradation remain the primary environmental issues confronting countries in MNA. Population pressure, particularly in crowded urban centers, exacerbates the incidence of pollution-related illness in many MNA countries. Additionally, while much progress has been made over the past few years in improving the quality of national environmental legislation, regulatory institutions remain weak.

Strategy outcomes

The objectives of the MNA Environment Strategy, which was adopted in 1995 and updated in 2001, are to improve both the quality of life and the quality of economic growth. MNA is focusing on mainstreaming environment into policies, programs, and projects through three main intermediate outcomes.

Improving public sector efficiency and environmental governance through better planning and priority setting of environment-related institutions, based on sound cost-benefit analysis and the participation of civil society. This will be achieved through developing and sharing knowledge on the use of economic criteria and valuation externalities and understanding the linkages between environment and poverty, trade, health, and energy for better allocation and efficient use of public expenditures in the environmental field. Recent accomplishments include the following:

- In Iran, the World Bank–supported Environment Management Support Project was approved in April 2003. This is the first phase of a long-term effort by the
MIDDLE EAST AND NORTH AFRICA REGION

government to improve environmental management. Its main objective is to enhance the capacity of the Department of Environment and other related agencies to plan, monitor, and enforce environmental regulations and action plans.

- In the recent Country Assistance Strategies for Algeria and Jordan, the linkages among environment, poverty, and health were described—notably in the discussions about improved urban water and sanitation and on sustainable land and watershed management.

- Building on an initiative developed through the Mediterranean Environmental Technical Assistance Program (METAP), national assessments of the cost of environmental degradation were prepared for Algeria, Egypt, Jordan, Lebanon, Morocco, Syria, and Tunisia, with Iran to be completed in the near future (see Tool boxes, page 54).

- METAP has completed assessments of environmental impacts on trade were done in Egypt, Jordan, Lebanon, Morocco, Syria, and Tunisia.

- In Tunisia, MNA prepared a Country Environmental Analysis (CEA)—a new Bank diagnostic report—to systematically evaluate environmental priorities. These reports assist MNA clients in mainstreaming environmental issues into relevant sector activities for greater poverty reduction and more sustainable development. A CEA also was started for Egypt.

- Energy-environment reviews were done in Iran and Egypt; these reviews help integrate energy sector development and investments with the country’s environmental objectives.

Planning of policies, programs, and projects, and on predictable environmental guidelines for private-sector development. This will require enhancement of the enabling environment through the development of environmental protection laws based on incentives and economic instruments, a workable system of Environmental Assessment, a well-structured learning program, and the use of Strategic Environmental Assessments as a tool for decisionmaking processes. Accomplishments in the last year include:

- An active effort in the region to evaluate the EA system, with the objective of harmonizing these systems with the safeguard policies of the Bank. Client training on safeguard policies and their implementation is now being institutionalized through the establishment of an EA center in Tunis. In-country training has been provided in Egypt, Lebanon, Morocco, Tunisia, and Yemen on Environmental Impact Assessments and Environmental Management Plans.

- The METAP Environmental Impact Assessment Initiative and its host, the International Center for Environment and Technology at Tunis, received the 2003 Regional Award for substantial contribution from the International Association for Impact Assessment (see <<www.citet_nat_tn>> or <<www.iaia.org>> for further information).

Lowering environmental health risks through the development of health-and-poverty-related prevention and mitigation measures in MNA’s selected portfolio of projects. In this area, opportunities include adding an environmental health component in water supply and sanitation and municipal waste projects, while at the same time enhancing local communities’ knowledge about the negative impacts of poor water and waste management practices. During fiscal 2003, MNA achievements included:

- In Egypt, preparation of a pilot study on the implications of water resources on income and the health of the poor.

- In Yemen, the Sana’a Water Basin Project was modified to address wastewater treatment, which will have beneficial health impacts for
surrounding farmers as the effluent is used in irrigation.

**Early signs of success**

After the introduction of the 1995 Strategy, one of the region’s first environment-related projects was the Algeria Industrial Pollution Control Project. This project, which was prepared during the early 1990s with the assistance of two METAP grants, aims at improving public health in Annaba (on Algeria’s northeast coast) by reducing levels of local industrial pollution. Through this project, the Government of Algeria was able to take necessary measures that were both environmentally and economically sound. The project financed environmental investments in two major industrial complexes—one producing fertilizers and the other iron and steel. Early on, the project financed the closing of two of the most polluting units.

Through the environmental investments component, major reductions in pollution have been achieved in the Annaba region. Specifically, the project has reduced the annual flow of phosphogypsum into Annaba Bay by nearly 300,000 tons. Anecdotal evidence suggests that improved water quality in the bay has had the unexpected positive side effect of increased yields for local fishers. Moreover, the significant reductions in nitrogen oxide and sulfur oxide emissions and fertilizer dust have resulted in seemingly lower rates of asthma and other respiratory ailments among the population. The Government of Algeria is currently carrying out a study to quantify these positive effects on the environment.

The project has also succeeded in promoting substantial reform in Algeria’s environmental laws and regulations, specifically including a new law for solid waste management; a new law on environmental protection; design and implementation of an important training program; and installation of air quality monitoring equipment in Algiers and Annaba.

**Tool boxes**

In 2003, MNA continued its pioneering work providing policymakers with economic tools for environmental sustainability, including costing environmental degradation and studying the environmental impacts of trade and competitiveness. These activities culminated in a June 2003 high-level meeting in Beirut to discuss these tools. The meeting was attended by more than 150 people from 17 countries.

One of the most useful tools is estimating the economic costs of ongoing environmental degradation. These studies provide decisionmakers with indicative data that allow them to use environmental damage cost assessments for priority setting and as an instrument for integrating environment into economic and social development. The tool provides estimates of damage and remediation costs for several areas, including water and air pollution, land and coastal degradation, and waste management. The specific objectives of this tool are to provide (1) a first-order estimate of the cost of environmental degradation with the most recent data available; (2) an analytical framework that can be applied periodically by professionals to assess the cost of environmental degradation over time; and (3) a basis for a training program for ministries, agencies, institutes, and other interested parties to incorporate assessments of the cost of environmental degradation in policymaking and environmental management. The two figures on this page show these costs as a percentage of GDP for the countries studied, which could be used as baseline indicators for mainstreaming environment policies, programs, and projects. More information can be found at either www.enviro-...
Long-term success

As the MNA countries continue to work toward the MDGs, the policy dialogue on managing water will be shaped by competing claims from multiple stakeholders for an increasingly scarce resource.

Water resources management will be addressed in the Iran Environment Management Support Project, and also as part of the Region’s water advisory program (fiscal years 2003-05). Water quality will also be integrated as a component in the water and sanitation projects in Yemen and Egypt. Through METAP, the Bank will also focus on water quality management by strengthening coordination and improving the policy, legal, institutional, and information framework.

Public-sector efficiency and governance support improvements in the management of environmental institutions and agencies. Lending activities include the Environment Management Support Project in Iran, Conservation of Medicinal/Herbal Plants GEF Project in Jordan, Tehran Solid Waste Management Project in Iran, and Municipal Waste Management Project in Algeria. Non-lending activities include work on safeguards review; safeguards training for clients, with an emphasis on project counterpart staff and their interlocutor ministries; the METAP Regional Capacity Building Program, which strengthens client environmental assessment systems; and the Regional Capacity Building Program for Solid Waste Management, which will establish centers of expertise in eight MNA countries.

Private-sector development will be promoted in the Conservation of Medicinal/Herbal Plants Project in Jordan. It will also be enhanced through METAP activities, including technical assistance on environment and trade, environment and finance, and particularly private-sector finance. The latter will include a pilot initiative on environment and banking aimed at reducing risk exposure through more environmental assessment of projects financed by the banking sector. Additionally, at the request of the Government of Yemen, the Bank is looking at ways to coordinate donor support for the development of local private-sector capacity for conducting Environmental Impact Assessments.

Gender will be given particular attention under the Environment Management Support Project in Iran, the Conservation of Medicinal/Herbal Plants Project in Jordan, and the Second Matruh Project in Egypt. The Jordan project will train women and disadvantaged groups in the conservation and sustainable management of plants, both in-situ and ex-situ, and in using these plants to manufacture products that will bring them greater benefit.

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The achievement of the Millennium Development Goals, especially those related to poverty and environmental sustainability, depends to a great extent on the performance of South Asia, where 40 percent of the world’s poor live, with half a billion earning less than $1 a day and twice that earning less than $2 a day. Half the children under five are malnourished and the region accounts for over a quarter of the global deaths in this group. More than one in three people without access to adequate sanitation live in the region, as do one in six people without access to safe water supply.

Water resources management

Water resource degradation problems—over-abstraction, waterlogging, salinization, and pollution—are widespread and severe in South Asia. In part, these problems have been caused by the limitations of current institutional arrangements for water resource management, as well as the absence of multi-stakeholder basin organizations and appropriate economic and regulatory instruments to promote integrated water resources management and improve the productivity of water.

Spurred by public awareness, judicial scrutiny, and government and NGO efforts, environmental aspects of water are under increasing scrutiny. The Bank is assisting some of the efforts to improve resource management as well as water service delivery. In Pakistan, for example, the Bank is supporting institutional reforms through the National Drainage Program and emergency drought assistance, and in India, the creation of water resources management and basin organizations based on clear principles of engagement and reform.

In the Palar Basin in Tamil Nadu, the Bank is supporting the preparation of basin plans through multi-stakeholder participatory processes and analytical work. A strategic basin environmental assessment process has helped identify and prioritize key environmental issues and outline solutions.
SOUTH ASIA REGION

THE QUEST FOR A SUSTAINABLE SOLUTION TO THE ARSENIC PROBLEM IN BANGLADESH

In many areas of Bangladesh (as in some areas in India and Nepal), groundwater, the primary source of drinking water, has dangerously high levels of arsenic contamination. Millions of people are potentially at risk of arsenic poisoning. The Bank, in coordination with other donors and NGOs, is assisting the government and local communities with the piloting of piped systems as an option to provide safe water in rural areas. The pilots will provide lessons on the appropriateness of this technology and possible institutional arrangements involving the private and NGO sectors in the delivery of sustainable water supply services.

Using basin decision support systems and tools such as GIS and remote sensing, stakeholders can make a fuller appraisal of the key “hardware” and “software” options for water resources development and management. In Nepal, the Bank has financed the development of a recently adopted National Water Resources Strategy and follow-up plans for sustainable and optimum utilization of its strategic water resources.

Promoting greater synergy between achieving MDG targets in water supply and sanitation and environmental health will remain a key focus of the Bank’s future program (see Box, above). Efficient infrastructure services such as water supply and sanitation are vital to improved environmental health. In India, diarrhea alone is the second leading cause of child mortality, with over 700,000 deaths per year. The Bank is supporting countries in incorporating in their projects simple measures individuals can take at home to cleanse their water. Home chlorination is a feature of the Maharashtra (India) Rural Water Supply and Sanitation Project. In Nepal—as in other countries such as Ghana, Peru, and Senegal—the Bank is fostering public-private partnerships to promote hand-washing with soap. One specific challenge in India is to upgrade intermittent water supply services, which are ineffective in providing reliable service or health benefits or in helping to conserve water, to a continuous system.

Natural resources management

Sustainable natural resources management requires broad policy and institutional frameworks to support both holistic and community-driven approaches. The Bank is assisting the region in conserving its rich biodiversity while providing communities with new livelihoods and income opportunities. In India, the Bank and GEF-supported Ecodevelopment Project is providing innovative development opportunities to poor communities living in and around seven of the country’s most important national parks, including Gir, home to the last remaining population of Asian lions. Across the country, from Gujarat to West Bengal and Kerala, more than 350,000 villagers are organized into ecodevelopment committees, including tribal peoples who are among the poorest and most dependent on natural resources. Creative solutions are being used, ranging from rehabilitation of traditional water-collecting points, bawari, at ancient historical sites at Ranthambhore, Rajasthan, to the use of ex-poachers’ knowledge of the forest in Periyar, Kerala, to develop a new ecotourism venture. All seven states have passed new ecodevelopment legislation and are adopting the ecodevelopment model for other parks.

The Bank is supporting integrated pest management approaches, phasing out the use of hazardous pesticides. The Diversified Agricultural Support Project in Uttar Pradesh and Uttarakhand is supporting these states in environmentally friendly agricultural practices such as the use of compost, vermicompost, biofertilizers, biopesticides, and green manure.

Indigenous knowledge can be a useful tool for environmental sustainability in rural areas. The state of Karnataka is implementing the first stage of an ambitious program to rehabilitate, jointly with communities, traditional water harvesting structures, some of them centuries-old. An innovative program to safeguard traditional knowledge is being piloted under the GEF Conservation and Sustainable Use of Medicinal Plants Project in Sri Lanka. The project is sup-

A river and mountainous landscape in Nepal.
porting the Guru-kula apprenticeship training program, where young village students are undergoing training under the tutelage of older ayurveda physicians and exchanging information with East African nations on a variety of technical, legal, and institutional issues related to indigenous knowledge.

Environmental health and infrastructure services

Infrastructure development is crucial for economic growth and poverty reduction, and is an essential part of Bank support in the region. The Bank pays close attention to ensuring the environmental sustainability of large infrastructure investments. For example, in the highways sector in India—with expected investments of about $20 billion over the next five years—the Bank has been providing close to $1 billion per year. The road agencies in India have taken significant strides in understanding and mitigating the environmental implications of the sector. Transport agencies are expected to pay increasing attention to environmental and social aspects of highway projects, evaluation frameworks, and the implementation of mitigation measures in the field.

The Bank is also active in urban (see Box) and indoor air pollution (IAP) programs, largely because of the growing and alarming evidence of the large health impacts of IAP from cooking and heating with traditional biomass fuels, particularly in rural areas. The WHO World Health Report—2002 ranks indoor smoke from solid household fuels as the fourth leading cause of illness and premature death in developing countries (the third leading cause in India), just below malnutrition and lack of safe sanitation and drinking water.

The environment and energy divisions of the Bank are jointly supporting several governmental partners in India, reflecting the multi-sectoral nature of the problem. A recent study evaluated household fuel choices and the impact of fuel pricing and distribution policies. The study showed that subsidies for domestic kerosene and LPG are not effective in promoting equitable access to these clean cooking fuels. The main beneficiaries of the LPG subsidy are the urban rich, while as much as half of the kerosene subsidy is diverted, mainly to the transport sector. Eliminating subsidies and fostering open and competitive markets for these fuels, while strengthening the government’s capacity to enforce quality and safety standards, is a better approach. The study also illustrated the greater challenge in rural areas, where income levels are lower. A long-term market transformation toward cleaner options and biomass-based technologies is needed in rural areas. This change needs a parallel development of rural micro-enterprises for energy products and services, as well as greater involvement of NGOs and local government bodies in outreach and social marketing activities, particularly to promote low-cost measures to reduce IAP, such as behavioral change or simple house design improvements.

Global commons

In South Asia, the Bank strategy on global issues has focused on securing tangible local benefits. Building on one of the largest and most successful Montreal Protocol programs to phase out ozone-depleting substances in India and Pakistan, the Bank is now assisting countries to deal with persistent organic pollutants. These chemicals have been found in many food products and even bottled drinking water. A regional assessment of the issues and options on POPs has been initiated and will form the basis for a new program with Bank and GEF support.

The South Asia region is highly vulnerable to the impacts of climate variability and change. Bank efforts have focused on helping the region in post-disaster recovery efforts and greenhouse gas emissions reduction programs. The agenda is now shifting toward building in-country capacity for adaptation to natural variability and long-term climate change, as well as in disaster preparedness and management. A regional assessment of these issues has recently been initiated.

Support for climate change mitigation, in partnership with GEF and other donors,
also continues. Two rural electrification projects—in Sri Lanka and Bangladesh—with renewable energy components supported by GEF were initiated last year, and a GEF renewable energy project is under development in Nepal. India, which is the largest emitter of CO₂ in the region, remains a strong focus. The recent Energy Conservation Act adopted by the Government of India provides a good foundation for scaling up energy conservation initiatives, some of which will be supported by a GEF Energy Conservation Policy Implementation Project under preparation.

Environmental policy and institutions

Assisting South Asian countries to strengthen their policy and institutional frameworks and build local environmental management capacity is at the heart of Bank activities. In Sri Lanka, successful capacity building efforts at the Central Environmental Agency (CEA) over the past five years have been extended to supporting district offices. In recognition of strong links between sound environmental management and the country’s development goals, the Sri Lanka Poverty Reduction Strategy Credit includes specific support to regionalizing the CEA and streamlining its major functions.

Recent initiatives have also focused on upstream analysis and identification of major environmental concerns to better integrate environmental objectives in the development planning process. A Country Environmental Analysis in Pakistan takes a strategic view of environmental issues, policies, and institutions, and lays out the basis for addressing key issues in the country’s poverty reduction strategy and development programs. Technical assistance programs to enhance environmental planning, monitoring, regulation and enforcement capabilities were launched last year in Andhra Pradesh and Karnataka, India. The India Industrial Pollution Prevention Project has helped strengthen the laboratory, awareness building, and information management capacity in six state pollution control boards. In Karnataka, the program supported an extensive multi-stakeholder process to prepare the first State of the Environment Report and Action Plan. In Bhutan, a program to use Strategic Environmental Assessment is in development planning activities has been launched. The increased attention in the region to environmental sustainability as an integral part of the development agenda is an encouraging sign and the Bank is trying to best support this through its facilitating, knowledge, and financing services.

At the end of June 2003 the active portfolio of World Bank environmental lending in the SAR Region was $2.2 billion. In fiscal 2003, new total environmental lending amounted to $94 million.

**The SAR Regional Environment Portfolio**

![Diagram of environmental portfolio]

- Water resource management: 18%
- Pollution management: 41%
- Land management: 4%
- Other environmental management: 4%
- Biodiversity: 3%
- Climate change: 13%
- Environmental policy and institutions: 17%

This article was prepared by Nagaraja Rao Harshadeep, (202) 473-9173, fax (202) 522-1664, Kseniya Lvovsky, (202) 473-6120, fax (202) 522-1664, and other members of the South Asia Environment and Social Unit. SAR website: <www.worldbank.org/sar>.
The past year brought into sharp relief several major challenges for sustainable development in IFC’s member nations. The global economy—facing a combination of corporate governance scandals, overcapacity in key sectors, political instability, slowed trade negotiations, SARS, and backlashes in some places against market liberalization—continued to struggle to regain momentum from its steepest decline since the oil crisis of 1973.

The situation in many developing countries remains challenging. Some 2.5–3 billion people in developing countries continue to live on less than $2 a day. Over the next 30 years, the world’s population is expected to increase by an additional 2 billion, with nearly all the increase occurring in developing countries. To address this increase in population among other challenges, growth and innovative approaches are essential.

Together, these factors have placed private-sector investment as an engine for economic growth at the forefront of the poverty reduction agenda. But the World Summit on Sustainable Development, held in September 2002 in Johannesburg, underscored the sobering reality that the global growth needed in coming decades cannot be achieved using the methods and models of the past. Throughout the developing world, clean water, clean air, biodiversity, fisheries, and fertile soils are all at risk because of unsustainable growth.

The need for IFC’s capital is clear, but so also is the need for IFC to pioneer the creative solutions that will contribute to the sustainability of private-sector activity in emerging markets.

**IFC’s fiscal 2003 water supply and sanitation projects**

IFC considers infrastructure, including water and sanitation networks, a priority sector and has participated in a number of investments in fiscal 2003. To achieve Millennium Development Goal (MDG) targets, it is estimated that 1.5 billion people will have to gain access to water, while 2 billion must receive adequate sanitation services by 2015. These improvements will require a doubling of current global investment levels from $15 billion to $30 billion per year over this period.

To account for this dire need for increased investment, private sources of capital will be essential. Governments around the world, in developed and industrial countries alike, have begun to turn to private operators in an effort to improve the efficiency and reach of their water and sanitation...
services. Details of our fiscal 2003 investment commitments in water supply and sanitation follow (see Table, below).

**IFC’s sustainability update**

In fiscal 2003, IFC took advantage of opportunities to engage with sustainability leaders, participate in global discussions, and provide research regarding the business case for sustainability. IFC also trained staff on sustainability issues and the use of IFC’s sustainability tools. The following are highlights from these efforts.

*IFC participation at the Johannesburg summit.* At Johannesburg, IFC co-hosted an event with the World Business Council for Sustainable Development and its regional chapters. This event, “The Business Case for Sustainable Development: Doing Good and Doing Well,” featured speakers and presentations from some of the leading experts on sustainability in the developing world. Four IFC investment client companies—DESC, a Mexican chemicals firm; Spier Estates, a South African tourism concern; Intercell, a pulp and paper producer in Poland; and Sinoforest, a Chinese forestry company—participated in the event.

**Sustainable economic benefits from saving species.** As part of its commitment to preserving biodiversity in developing countries, IFC has launched innovative projects in Peru and Mongolia in partnership with local civil society organizations. The projects are funded by the Global Environment Facility.

In the rain forests of Peru, IFC is working with two nongovernmental organizations to establish a ranching and export business for poison dart frogs. This will help rural communities generate income from a practice that enriches environmental organizations to for local nomadic communities. The project contributes $1 million to help the Taiman Conservation Fund, a nongovernmental organization, develop a financially sustainable conservation management system for the Eg-Urr watershed. The plan allows for development of low-impact tourism in this wild and scenic waterway.

**Facility funding for environmental improvements.** IFC has established environmental and social facilities designed to scale up the institution’s ability to promote change through its client companies. The facilities have become fully operational and were instrumental in facilitating many environmental programs through the private sector over the past year. For example:

- IFC’s Environmental Opportunities Facility will make $120,000 available to Grupo Calidra, a Mexican lime producer, for the installation of water recovery equipment as part of a pilot to test the feasibility of the approach.

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**Table: IFC’s fiscal 2003 investments in water supply and sanitation**

<table>
<thead>
<tr>
<th>Project</th>
<th>Country</th>
<th>Description</th>
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<tbody>
<tr>
<td>AAA</td>
<td>Colombia</td>
<td>IFC is guaranteeing payment of up to $24 million for two local currency bonds issued by a private company to fund improvements in water and sanitation to over 1.5 million people in Barranquilla, Colombia. The company—a water, sanitation, and solid waste service utility—will be expanding service to the southwest part of the city, its poorest area. New construction will connect 350,000 previously unserved people to safe water and adequate sanitation services by the end of 2003.</td>
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<tr>
<td>Aguas de Panama</td>
<td>Panama</td>
<td>IFC will provide a $5 million loan and syndicated loans totaling $9 million to Aguas de Panama in connection with its provision of treated potable water to the urban areas of Arraijan, Chorrera, and Capira. The project is to construct and operate a water treatment plant to supply treated potable water to the existing distribution network, which serves 270,000 people.</td>
</tr>
<tr>
<td>Manila Water Co., Inc.</td>
<td>Philippines</td>
<td>IFC will lend $50 million to Manila Water as it develops new water sources, expands service to east and southeast portions of Manila, improves its distribution network, expands water supply facilities, and increases provision of sewage and sanitation services. Manila Water makes special arrangements to increase service to the poorest areas. It works through community leaders to establish neighborhood cooperatives to manage water systems and allows for the sharing of costs and use of water meters among residents. Since the program’s inception in 1998, 306,000 residents have been connected to safe and uninterrupted water service. Through the planned expansion, 350,000 new people will be served. Connected households pay $.07 per cubic meter of water as compared to $1.96 per cubic meter charged by water vendors, previously the only alternative for safe water in the poorer areas of the city.</td>
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EQUATOR PRINCIPLES — COMMERCIAL BANKS ADOPT IFC/WORLD BANK STANDARDS

On June 4, 2003, IFC played host to 10 leading banks from seven countries as they announced their commitment to environmental and social responsibility through the adoption of the "Equator Principles." ABN AMRO, Barclays PLC, Citigroup, Credit Lyonnais, Credit Suisse Group, HVB Group, Rabobank, Royal Bank of Scotland, WestLB AG, and Westpac Banking Corporation will apply these voluntary principles, which are based on the environmental and social policies and guidelines of the IFC and World Bank, to their global project-finance activities in all industry sectors.

"In all my years as an investment banker, this is unprecedented," said Peter Woicke, Executive Vice President of the IFC. "And we could not be happier to be associated with this path-breaking initiative." Woicke pointed to three reasons why the adoption of the Equator Principles by commercial banks is such an important development. The first is the sheer amount of global investment—estimated to be a staggering $100 billion over the next 10 years—that will be subject to the application of the principles. (The banks will apply the Equator Principles to all project finance lending involving projects with a capital cost of $50 million or greater.) Second, the Equator Principles, unlike many voluntary codes that apply only to a single industry, are impressive in both breadth and reach. They will affect project financing across multiple industries from forestry and manufacturing to oil, gas, mining and infrastructure. Third, the adoption of the Equator Principles explicitly recognizes the interdependence between the fate of the rich economies on the one hand and responsible growth and development in the poorer economies on the other—an issue at the heart of the globalization debate.

For IFC and the World Bank, the fact that these major banks have chosen our environmental and social requirements as the benchmark for commercial banking operations in emerging markets confirms the importance of a continued global role for the private sector in promoting sustainable development and good practice. It also affirms the fact that IFC's in-house environmental and social expertise and capacity represents tremendous value for clients, sponsors, co-investors, and member countries, and that these strengths distinguish IFC from other development finance institutions.

The plants are located in desert locations where water is scarce and is essential to the production process. The water recovery equipment will permit recovery of roughly 10 percent of the water used in processing. If successful, the company will replicate for all its operations in desert regions.

The grasslands of the Ha Tien Plain in southwest Vietnam represent the last ecosystems of their type in Vietnam and hold significant biodiversity, including the globally endangered Sarus Crane—the world’s tallest flying bird and a cultural icon throughout the region. The area has been subject to rapid conversion, much of it unsustainable. In collaboration with Holcim Vietnam (an IFC client based in the region) and the International Crane Foundation, the Corporate Citizenship Facility (CCF) supported a land use mapping and critical natural habitat identification exercise from January to April 2003. The results of this work were presented in a workshop to key stakeholders in May 2003, from which two specific conservation proposals emerged. The next stage of the project will be to subject these proposals to a detailed feasibility analysis.

Favorita Fruit, an IFC client in Ecuador, was the first company to have all its owned farms certified to the Rainforest Alliance-sponsored Eco-OK/Better Banana standard for environmental and labor practices. In an effort to encourage better performance in its supply chain, Favorita has sought CCF funding to conduct a program of outreach and training for over 320 independent banana growers.

Funded through IFC’s Sustainable Financial Markets Facility, Market Intelligence Briefs (MIB) are a series of concise publications designed to familiarize IFC financial intermediary clients with a range of sustainability issues relevant to their operations. An MIB giving a general overview of sustainability issues affecting financial institutions is currently in production, as is one on socially responsible investing and its applicability to emerging markets.

This article was prepared by Harry Pastuszek, (202) 473-1382, hpastuszek@ifc.org, of the Environment and Social Development Department of the IFC. For more information please visit: <www.ifc.org/enviro> and <www.ifc.org/sustainability>.
WORLD BANK INSTITUTE
Promoting knowledge and learning for a better world

SUSTAINABLE DEVELOPMENT LEARNING ACTIVITIES

WBI's Sustainable Development learning program delivered more than 150 learning activities and programs in fiscal year 2003. Topics included water management, water and sanitation services, improving air quality (through the Clean Air Initiative partnerships program), climate change, environmental economics and management, environmental governance, markets for biodiversity, consensus building for natural resources management, community empowerment and social inclusion, and rural poverty and development. A range of activities has also been offered as part of the preparations and follow-ups to the Johannesburg 2002 Summit and the World Development Report 2003 on sustainable development. WBI's Sustainable Development program is geared toward policymakers, parliamentarians, practitioners, academics, researchers, journalists, and nongovernmental organizations. For more information, visit the website at: <<www.worldbank.org/wbi/sustainabledevelopment>>.

Collaborating through partners

In collaboration with partners worldwide, WBI delivered more than 715 learning offerings in fiscal 2003, reaching nearly 56,000 client participants from 200 countries in all major regions of the world. These included face-to-face activities using traditional media such as print materials, as well as distance learning programs that rely on Internet tools and interactive video-conferencing to bring together participants from different cities, countries, or regions. WBI continues to offer a wide range of learning and training events related to sustainable development, including those specifically focused on water.

WBI brings together an alliance of partner organizations to leverage the resources and expertise needed to broaden the reach of knowledge programs, to strengthen their impact, and to promote the sharing of local and global knowledge. WBI has formal agreements with more than 115 organizations and works informally with an additional 250. WBI collaborates closely with local institutions to help them build in-country capacity and help clients achieve their own poverty reduction and sustainable development objectives.

Client focus and innovative approaches

Experience shows that WBI can achieve its greatest impact by customizing its programs to the priority needs of the Bank’s client countries, offering best-practice pedagogy, helping to maintain a sustained presence at the country level through local partners, and collaborating with those who can implement policy decisions. WBI has adopted a country focus for its activities, matching these even more closely with client country demands and the Bank’s Country Assistance Strategies.

The Global Development Learning Network (GDLN) is an essential part of the Bank’s campaign to scale up development efforts through technology. Launched by WBI and operating since September 2000, the GDLN is a worldwide partnership of nearly 60 distance learning centers, all operating on the same technology platform, with a mandate to use distance learning techniques to advance development.

B-SPAN, an Internet-based broadcasting station initiated by WBI, continues to provide open access to World Bank seminars, workshops, and conferences on a variety of sustainable development and poverty reduction issues by making these available to the
**WBI’s Water Program & Learning Activities**

The key objectives of WBI’s Water Program are to:

- Strengthen current core water learning activities, with an emphasis on water sector reforms aimed at improving water services to the poor
- Develop and deliver policy advice and skills development services in water resources management in support of Bank priorities, including the MDGs
- Create a suite of learning products for targeted aspects of water management that are useful to client countries
- Build consensus for the reform agenda in the water sector through advocacy and public awareness activities, and help implement action plans through partnerships, particularly utilizing distance learning technology.

For example, the Water Media Network, which includes more than 700 journalists worldwide, is helping to strengthen public awareness of water issues and to improve water reporting. Nearly 70 journalists from the network, representing 40 different countries, were selected through a global competition to attend the 3rd World Water Forum in Kyoto in March 2003. They published more than 400 stories during the week about the forum and water issues in their countries.

Other examples of Water Program activities include support for the creation of an African network of water sector reform coordinators who are sharing valuable experiences and knowledge in a decentralized way and national-level country-specific policy workshops for key stakeholders to advance sector reforms.

For more information on WBI’s Water Program, contact Vahid Alavian (202-473-3602), and visit the website at: <<www.worldbank.org/wbi/sdwater>>.

**NewsUpdates**

- Trust Fund for Environmentally and Socially Sustainable Development (TFESSD) Receives $12.7 million

The TFESSD is a large multi-donor umbrella fund that received $12.7 million in fiscal 2003 from the governments of Norway and Finland (who joined the TFESSD in December 2002). The TFESSD provides grant resources for World Bank activities that mainstream environmental, social, and poverty-reducing dimensions of sustainable development. It gives priority to multi-sectoral proposals that cut across themes. Half of all TFESSD funds are devoted to work in Sub-Saharan Africa; elsewhere, IDA countries are preferred. The approach and structure of the TFESSD are now considered as best practice among trust funds in the Bank. The Environment Window of the TFESSD is actively used to support strategic analytic work and strengthening of client capacity in support of the Bank’s Environment Strategy. At the end of fiscal 2003, the TFESSD was supporting 108 activities; 47 additional activities have been approved for fiscal 2004.

The Bank Group’s greening efforts are a reflection of the strong need for environmental accountability, not only in its core lending activities and development assistance, but also in its own internal operations. The Bank now purchases 10 percent of its energy from renewable sources (6 percent is wind energy from a local wind farm), making the Bank the largest single purchaser of renewable energy in the Washington area. The Bank’s effort to reduce the “carbon footprint” of its facilities has been recognized by the U.S. Environmental Protection Agency with the Energy Star Award (a symbol of energy efficiency) for two of its buildings. The Bank has also instituted an incentive program to encourage staff to use public transportation for their commute to work.

**Toward a Strategic Approach to Chemicals Management**

With the increasing recognition of the serious health and environmental issues associated with chemical production, attention is focusing on concerted global action toward chemical management. The 2002 World Summit on Sustainable Development Plan of Implementation sets a goal of using and producing chemicals in ways that minimize adverse effects on health and the environment by 2020, and calls for the development of a strategic approach to international chemicals management (SAICM). The first preparatory meeting leading to a SAICM is scheduled for November 2003 in Bangkok; representatives from governments, nonproffits, industry, and intergovernmental organizations will attend. After 2005, a high-level ministerial meeting will make decisions about the scope and objectives of the SAICM.
A SELECTION OF WORLD BANK GROUP ENVIRONMENTAL PUBLICATIONS

The following publications may be obtained by sending an email to eadvisor@worldbank.org, or by phoning the Environment Department Publications Unit at (202) 473-2976.

Preventable Tragedies — The Impact of Toxic Substances on the Poor in Developing Countries
Lynn Goldman and Nga Tran
August 2002

Public Environmental Expenditure Reviews — Experience and Emerging Practice
Phil Swanson and Leiv Lunde
May 2003

Climate Change and Agriculture — A Review of Impacts and Adaptations
Pradeep Kurukulasuriya and Shane Rosenthal
June 2003. Published jointly with the Agriculture and Rural Development Department

A Decade of Environmental Lending
Anjali Acharya and Alethea M. T. Abuyuan
November 2002

A Critical Review of Literature on Structural Adjustment and the Environment
Anna Gueorguieva and Katharine Bolt
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Private Sector Development and the Environment — An Analysis of the World Bank Privatization Portfolio
Alethea M. T. Abuyuan
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A Selection of World Bank Group Environmental Publications — A Review of International Experience
Lisa Segnestam, Asa Persson, Mans Nilsson, Andres Arvidsson, and Ede Ijjasz
July 2003

Water Resources and Environment Technical Notes, 2003
Edited by Richard Davis and Rafik Hirji

G.1 Environmental Flows — Concepts and Methods
G.2 Environmental Flows — Case Studies
G.3 Environmental Flows — Flood Flows
D.1 Water Quality — Assessment and Protection
D.2 Water Quality — Wastewater Treatment
D.3 Water Quality — Nonpoint-Source Pollution
E.1 Irrigation and Drainage — Development
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Wastewater Reuse, Technical Note F.3 one of the series Water Resources and the Environment Technical Notes Edited by Richard Davis and Rafik Hirji. 2003.


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