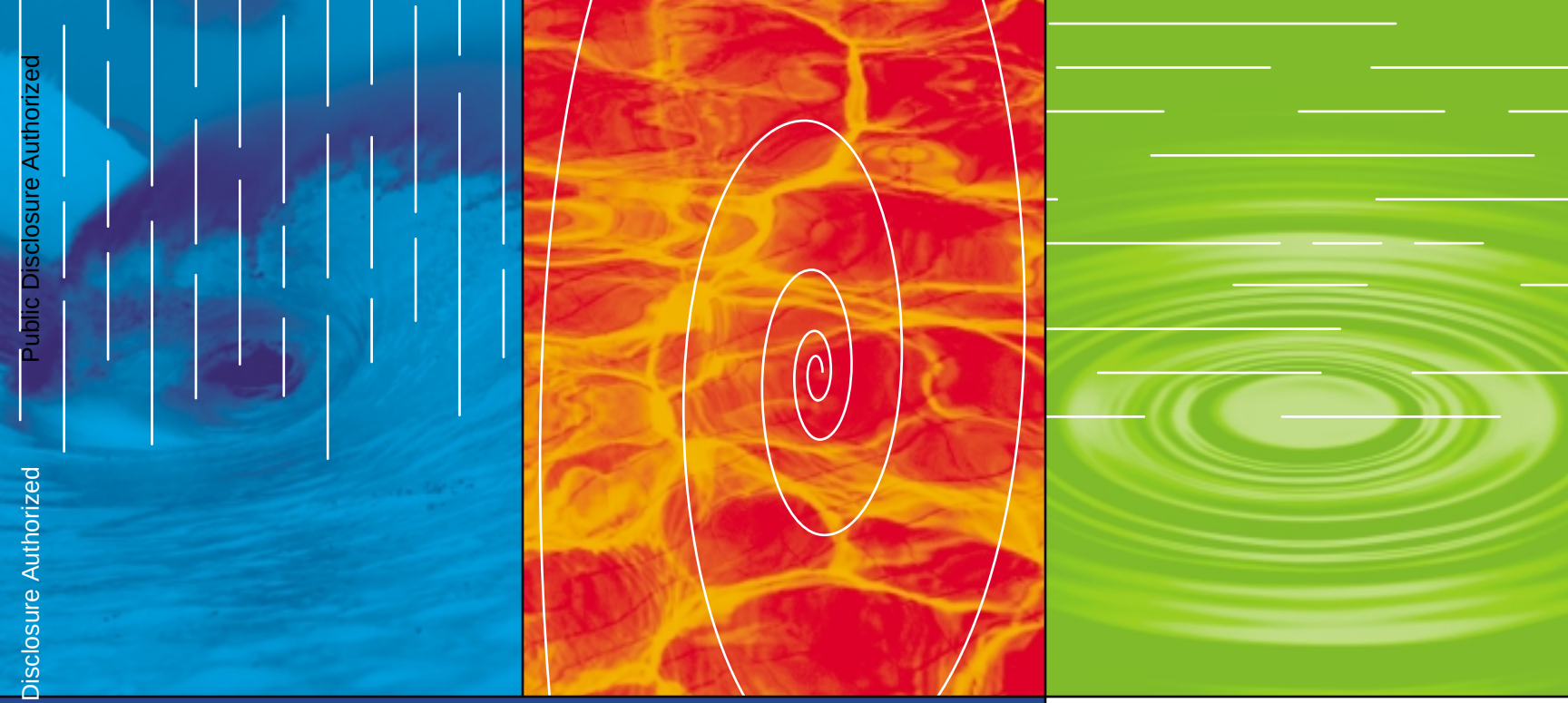

Stimulating Innovative Performance and Supporting World Bank Operations in Water Management

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bnwpp
Bank-Netherlands
Water Partnership Program

Foreword

In 2000, the Government of the Netherlands and the World Bank embarked on the Bank-Netherlands Water Partnership Program with the aim of creating an instrument for supporting innovation in the Bank's water resources management operations. Since then, the BNWPP has approved a total of 140 activities, 57 of which are already completed. They have touched upon a broad range of water aspects worldwide, ranging from support for the development of national water strategies, to analysis of water rights systems, to improving irrigation performance through benchmarking, to introducing the use of remote sensing techniques as a water resources tool, and to ensuring that the poor benefit from major water resources infrastructure.

The BNWPP is organized through thirteen windows, reflecting the most pertinent aspects of the water management agenda. Since its inception, the BNWPP has been refined by adding windows to respond to demand from the broader water community and Bank staff, such as the Livelihoods of the Poor window and the recently created Water Resources Legislation and National Strategies window.

Developing countries face daunting challenges in developing and managing their water resources in ways that promote growth, reduce poverty, and are environmentally sustainable. With about 20 percent of its lending directed towards water-related projects, the World Bank is an important partner for many developing countries. The BNWPP has become a modest but important tool in stimulating and mainstreaming innovative approaches to addressing these challenges. We encourage you to visit the BNWPP website www.worldbank.org/bnwpp to see what the BNWPP is doing.

John Briscoe
Senior Water Advisor
The World Bank

Bert Diphoorn
Head of Water Support Unit
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of Foreign Affairs

THE BNWPP MISSION IS TO INCREASE WATER SECURITY THROUGH THE SPONSORSHIP OF NOVEL APPROACHES IN INTEGRATED WATER RESOURCES MANAGEMENT, AND THEREBY CONTRIBUTE TO THE REDUCTION OF POVERTY.

Partnering for Better Water Resources Management

Established in 2000, the Bank-Netherlands Water Partnership Program's (BNWPP) mission is to increase water security through the sponsorship of novel approaches in Integrated Water Resources Management, and thereby contribute to the reduction of poverty.

As such, the Government of the Netherlands and the World Bank joined their expertise in Integrated Water Resources Management (IWRM) as partners. The Government of the Netherlands has identified improved water management in all its aspects as one of the most pressing development issues today. With extensive water management experience themselves, the Dutch have a long history cultivating expertise in this domain. The World Bank backs water projects throughout the developing world, and is well positioned to provide support for a variety of water activities, oversee the deployment of multi-disciplinary teams, and draw lessons from its experiences for broader applicability.

This brochure presents the BNWPP, its strategy and organization, and gives a brief explanation of the different water management issues addressed. Example case studies have been included to illustrate ways in which the BNWPP is integrated into and supports World Bank projects.

...ADDRESSING CONCRETE CHALLENGES IN SPECIFIC PROJECTS, THE BNWPP CONCENTRATES ON INNOVATIVE STRATEGIES THAT CAN BE GENERALIZED AND APPLIED WORLDWIDE.

The BNWPP Strategy

The driving force for the BNWPP is the understanding that the global water crisis is in fact a water management crisis. Therefore, the BNWPP focuses on water management reform, which is a long-term process of change. The aim is to make a difference by mobilizing practical expertise at critical stages of the project preparation process.

Broadly speaking, the BNWPP works on two principles. First, BNWPP assistance is demand-driven. That is, the BNWPP assists undertakings already associated with existing World Bank projects where staff connected with the project request BNWPP support. By reacting to such concrete requests and focusing assistance on reform issues, the BNWPP produces tangible results.

Secondly, in addressing concrete challenges in specific projects, the BNWPP concentrates on innovative strategies that can be generalized and applied worldwide. Lessons learned in South American irrigation systems might find applicability in Southeast Asian ones, for example. By assisting operations that have such potential, a project sponsored by the BNWPP has benefits that transcend the locality in question, helping to increase global knowledge about how to improve water resources management.

The BWNPP is organized into a number of sub-programs, or "windows," which concentrate on different aspects of IWRM. Most windows mobilize interdisciplinary teams with members drawn from both inside and outside the Bank.

Though a relatively small instrument – approximately US$5 million per year over 3 years – the BNWPP's impact is amplified by the fact that it focuses on

- improving operations already under preparation and implementation;
- preparing and disseminating best practices, lessons learned, and benchmarking;
- using expertise from outside the World Bank; and
- promoting cooperation with other partners in the water sector.

Types of Program Assistance and Output

The BNWPP provides financing for

- technical Assistance through the windows' core expert teams, or through individual, national, and international consultants;
- workshops, seminars, and training;
- knowledge management and dissemination.

Through August 2002, 140 activities have been approved, and 57 completed. Samples of activities are provided in this brochure.

Partnerships

The BNWPP coordinates activities and establishes partnerships with other organizations working in the water sector, and it welcomes opportunities to co-finance activities and collaborate. Its aim is to integrate results into the broader water-development community and directly support work with project teams in the Bank and/or the country. An example is the partnership with the U.K.'s Department for International Development (DFID) and the Groundwater Management Advisory Team through the Groundwater Management window. This partnership permits the extension of BNWPP services to the Global Water Partnership.

The companion program to the BNWPP is the Water and Sanitation Bank-Netherlands Water Partnership, which is primarily concerned with water and sanitation issues in World Bank operations. Information about the latter can be found at www.worldbank.org/watsan/bnwp.

How to Apply for Funds

- Proposals can be submitted by World Bank staff involved in projects that have a water resources dimension. Proposals should be submitted to the respective BNWPP window managers.
- A one-page proposal form is available on the Bank's Intranet or through the window managers.
- Proposals are accepted all year.

For Further Information:

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THE BNWPP AIMS TO INTEGRATE RESULTS INTO THE BROADER WATER-DEVELOPMENT COMMUNITY.

Program Structure

The program's action-oriented approach supports specific efforts through the individual windows. Each window is a sub-component of a broad framework that embraces comprehensive, cross-sectoral water management; water-user participation; transparent and efficient institutions; the treatment of water as a social and economic resource; the importance of water to the natural environment; and the link between water management and poverty alleviation.

Many of the problems addressed under the BNWPP are cross-cutting and may have implications for several windows. As a central part of program development, the program builds upon the synergy among windows – reflecting the most pressing reform issues – and allows the windows freedom to evolve. The lessons derived from the program, which are now starting to emerge, are made available to the broader water community through the BNWPP website, publications and other vehicles.

The issues addressed under the BNWPP windows cover a wide set of concerns and together represent a comprehensive approach to Integrated Water Resources Management (IWRM). Some of the windows may have more common themes, limits, or constituencies, while others – such as River Basin Management and Livelihoods of the Poor – transcend geographical, administrative, and institutional boundaries.

Windows with more of a water-delivery orientation, such as the Reforming Irrigation and Drainage Institutions window, the Dams Planning and Management window, and the Flood Management and Wastewater Management windows are more focused on institutional reform. Such issues cover improved transparency and accountability, decentralized management, or moving from a construction orientation to a more flexible and adaptive management orientation. In contrast with other windows, however, these services may only be targeted at a limited portion of the basin.

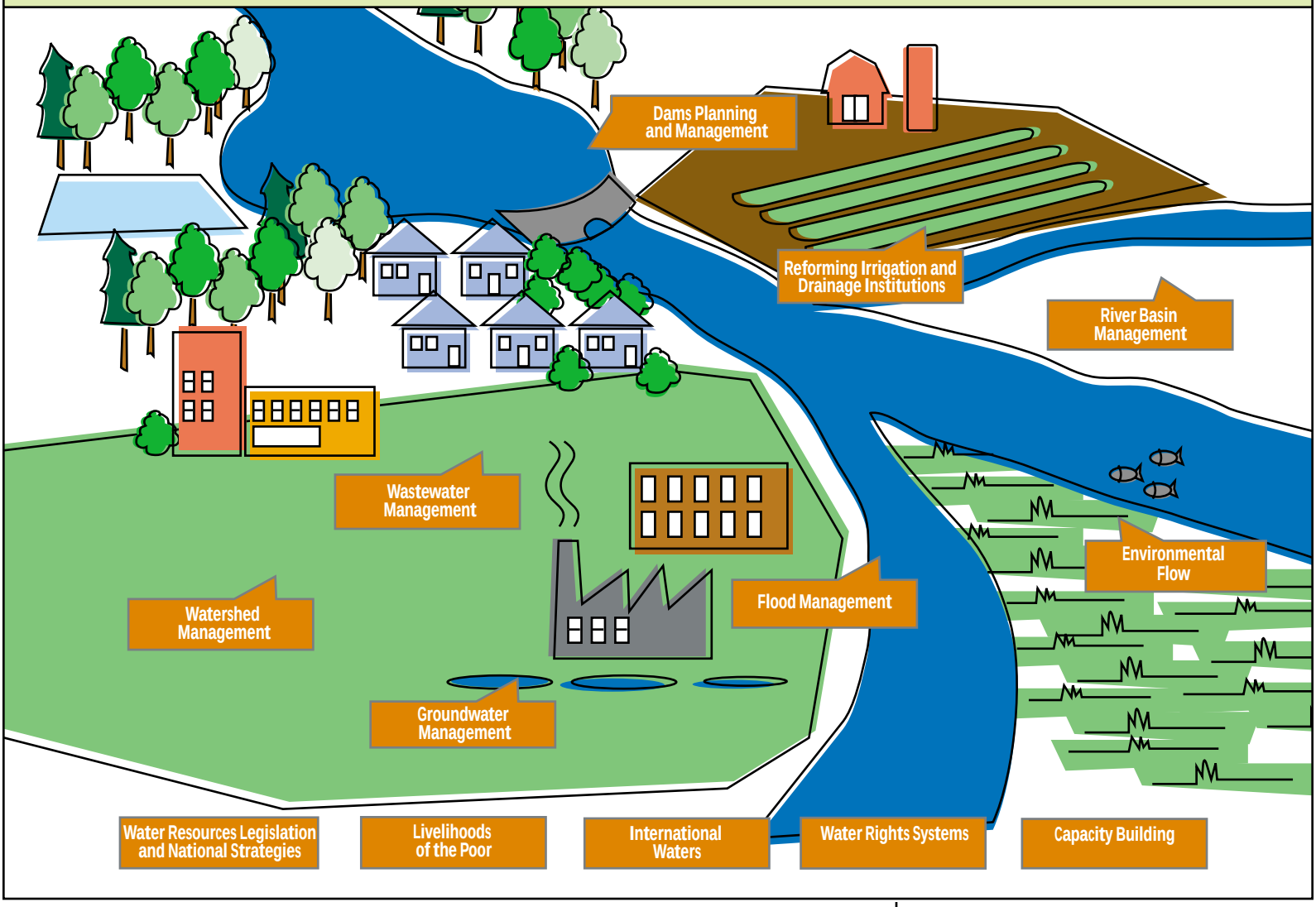
The Water Rights Systems, Groundwater Management, and Environmental Flow windows are more directly focused on institutional reform for overall IWRM and may have applicability throughout the basin. The Watershed Management window has more of a community focus and projects may involve local government or community groups. In contrast, the International Waters window may engage with multiple governments and many national agencies.

The BNWPP's 13 windows:

- Capacity Building
- Dams Planning and Management
- Environmental Flow
- Flood Management
- Groundwater Management
- International Waters
- Livelihoods of the Poor
- Reforming Irrigation and Drainage Institutions
- River Basin Management
- Wastewater Management
- Water Resources Legislation and National Strategies
- Water Rights Systems
- Watershed Management

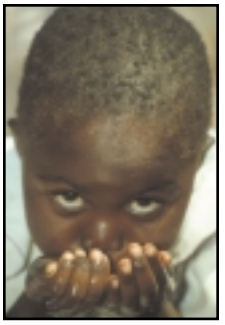
Together, the windows emphasize systemic reform within an IWRM approach. Developing capacity at all levels of society to carry out lasting reform is at the core of all the windows' activities. Ensuring that clients will be able to maintain their water resources systems well beyond the termination of a World Bank project is a central concern. Such improved capacity takes root both within the institutions of the World Bank's client countries as well as through enhancing World Bank operations in the water sector.

BNWPP Windows and Integrated Water Resources Management



Windows in Operation

Capacity Building



Objective: To provide advisory and applied training services, expanding the impact of Bank operations.

Often times World Bank training events provide only short-term education. Workshops and other training events only last a few days at most, and the knowledge gained may atrophy thereafter. The Capacity Building window, by contrast, strives to provide education and training services at the program level for a more enduring impact. The window provides educational services that support activities of other BNWPP windows while maintaining consistency with the new Bank Water Resources Sector Strategy and close alignment with Bank operations. The window also supports innovative ways to transform knowledge and lessons generated from Bank operations into training programs and materials for more effective and systematic capacity building.

Dams Planning and Management

Objective: To build on the core values and strategic priorities of the World Commission on Dams Report.

This window aims to produce knowledge management tools to further improve the quality of World Bank work with borrowers in dam projects. The window also spearheaded the Action Plan that is currently co-financed by several donors, including the Governments of Japan, Sweden, and Norway. Please see the case study on page 22.

Environmental Flow

Objective: To integrate environmental flow requirements into water allocation.

An experienced team of specialists promotes the development of water policies that balance the needs of the river ecosystems with human uses of water resources. In addition, the window supports the preparation of briefing notes and best practice cases for project teams and disseminates information through workshops and other venues. See the case study on page 24.

Flood Management

Objective: To improve World Bank assistance in urban and rural flood management.

The Flood Management window acknowledges that flood mitigation is part of integrated water management, and tries to emphasize structural, preventive action, rather than simply post-flood relief. The window encourages government agencies to cooperate in integrating flood management with land use management, and with other aspects of the basins, and fosters the establishment of sustainable flood management service organizations. The challenge is often to transform unresponsive, centralized bureaucracies into service-oriented, decentralized agencies, accountable to local shareholders. See the case study on page 26.

Groundwater Management

Objective: To provide integrated technical, institutional, and legal expertise in groundwater management.

Under this window, an experienced core team (the GW-MATE – Groundwater Management Advisory Team) provides support for sustainable groundwater management – not only in traditional water management projects, but also in projects targeting water services that rely on groundwater resources, such as water supply and irrigation. This window provides its services both to the World Bank, and, with additional funding from the British Government, to the Global Water Partnership. See the case study on page 18 and the GW-MATE website at www.worldbank.org/gwmate.

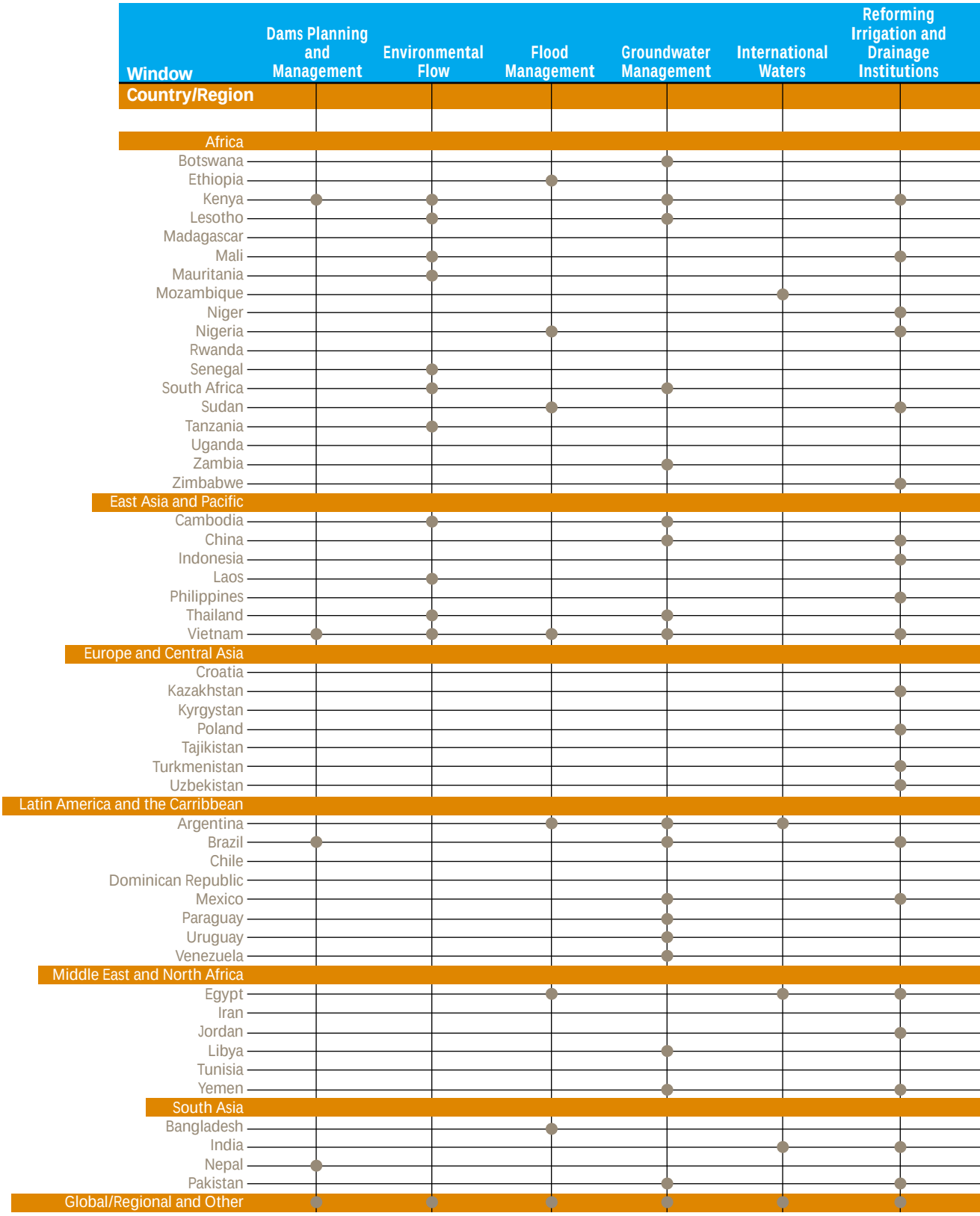
In all BNWPP operations, continuity in team membership is encouraged, so that lessons learned from these experiences can be applied throughout the world.

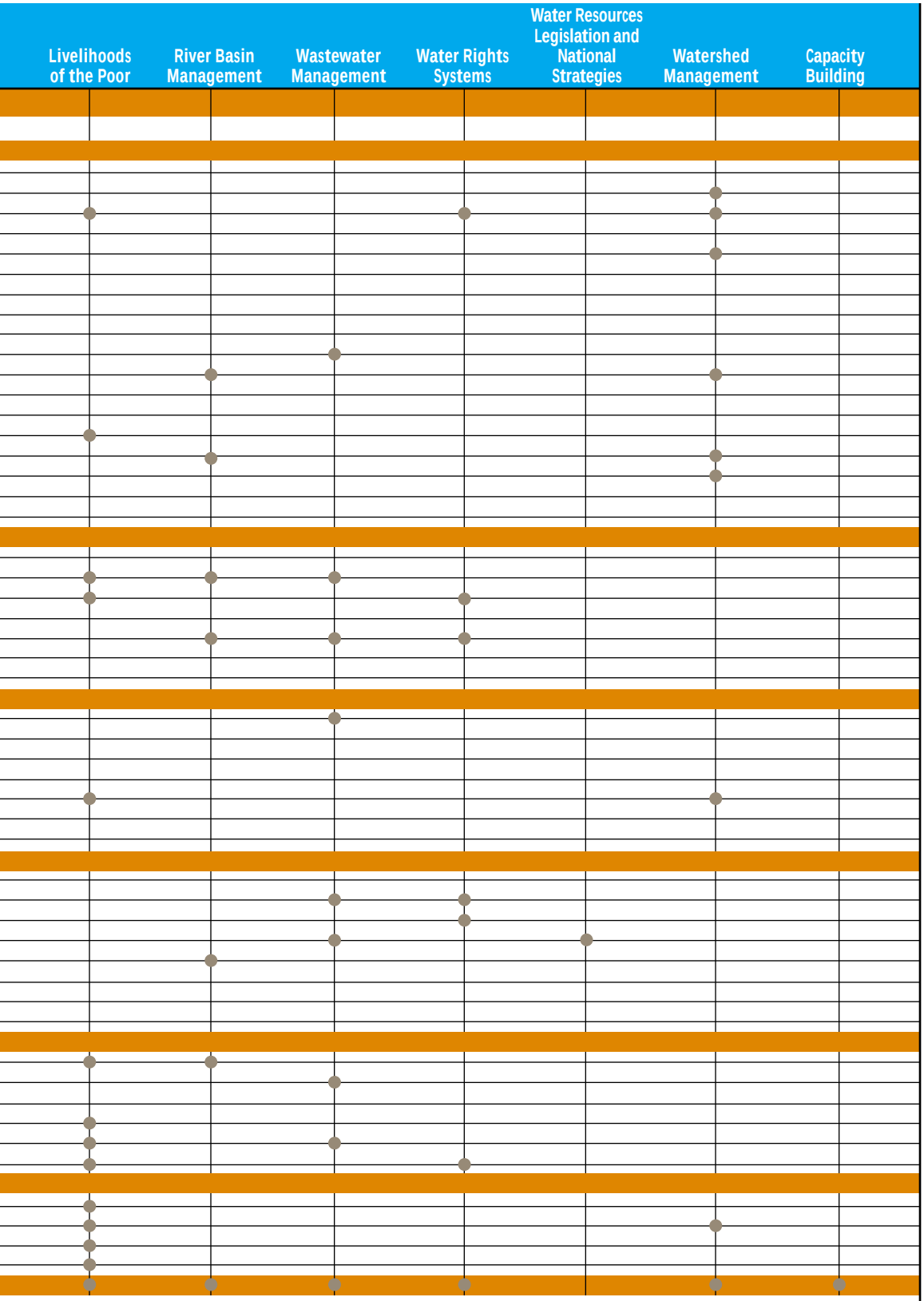
International Waters

Objective: To improve collaboration over international shared water resources.

Through this window, a group of experts in a variety of disciplines related to international collaboration support Bank operations in the complex field of transboundary waters. This may include training in transboundary waters management, or facilitation of cooperation between parties.

Windows in Operation





Geographical Distribution

of World Bank Operations

Supported by the BNWPP

Windows in Operation

THE WATERSHED MANAGEMENT WINDOW MAKES PLANNING AND MANAGEMENT MORE SENSITIVE TO THE NEEDS OF LOCAL POPULATIONS.

Livelihoods of the Poor

Objective: To increase the participation of poor people in water resources management.

In the interest of better understanding and serving the needs of poor people, this window fosters the assessment of the poor's access to and use of existing water resources, and strengthens project design to include the poor's representation in institutions through which water policy is made.

Reforming Irrigation and Drainage Institutions

Objective: To increase transparency and accountability for better irrigation management.

With special importance in areas with water-scarcity problems, a team of irrigation experts supports efforts to increase socially responsible and efficient irrigation systems through benchmarking, through the assessment of institutional options, by improving civic support, and by encouraging water-user participation. See the case study on page 16.

River Basin Management

Objective: To assist in establishment of institutional frameworks and improvement of technological approaches to manage water at the river basin level.

The window provides advice and assistance in technical and institutional aspects related to improved river basin management, including improvements to river basin planning and operations. Technical aspects include monitoring, modeling, and knowledge management. The window also supports the development and strengthening of institutional arrangements and mechanisms to improve river basin management, including building cooperation between different sectors of government and various stakeholders responsible for developing and managing water and basin resources. See the case study on page 14

Watershed Management

Objective: To improve integration of the land, water, and social dimensions of watersheds.

The window encourages empowerment of local government in the management of watersheds through decentralization in the planning process. By procuring expert advice to assist in the support of local planners, this window assists in the responsible decentralization of watershed planning and management, making such processes more sensitive to the needs of local populations.

Wastewater Management

Objective: To provide guidance on appropriate levels of municipal investment in wastewater treatment and disposal.

A team of international experts provides technical advice to Bank operations staff and supports project development. The window provides guidance through practical experience and with a commitment to a comprehensive approach and to protecting the environment, keeping in mind that resources are limited. See the case study on page 20.

Water Rights Systems

Objective: To stimulate the use of rights-based systems of water allocation.

The window, which relies on experts with practical experience in water rights administration, focuses on the legal and institutional infrastructure necessary to introduce and maintain a healthy system of water rights. The window supports project components that deal with water rights, distilling lessons from past operations, applying innovative practices they have found to be effective in a range of countries, and contributing with in-depth studies of existing water rights systems.

Water Resources Legislation and National Strategies

Objective: To assist in the development of legal infrastructure and policy at the national level.

This window provides support for the development of countries' water resources legislation and water resources management strategies at the national level. It was created in response to increasing demand from the Bank's client countries to receive expert input into their development of new legal and institutional frameworks for water resources management.

Promoting User Participation to Achieve Sustainable Water Use in Mexico

Overuse of water in regions upstream of Lake Chapala, Mexico's largest natural lake, is threatening its very existence. By working with existing water-user-based institutions, a BNWPP-financed study hopes not only to bring about a more sustainable water-use policy in the region, but also to empower local water users to become involved in shaping their own futures.

These cases illustrate how BNWPP support has been used to contribute to World Bank Operations. This sample of experiences ranges from participation of BNWPP-financed experts in preparation of projects, to preparation of studies to enhance understanding of a particular issue in client countries. Support has been provided to all types of projects, including water resources, irrigation, and sanitation projects.

Poor management of water resources in the Lerma-Chapala River Basin is threatening Lake Chapala, located in central Mexico near Guadalajara. Upstream of the lake, farmers grow water-intensive crops that have steadily reduced inflows to the lake, resulting in lower lake-water levels and shrinkage of the surface area. Not only is this worrisome for environmental, aesthetic, and recreational reasons, but also because the lake is the main source of water for the city of Guadalajara, with a population of nearly two million.

The Lerma-Chapala River Basin Council (LCRBC) was established in 1992 and has concentrated its efforts since then on improving water quality in the basin and in Lake Chapala, and on reaching and enforcing a river water allocation agreement with the various states in the basin. Although inflows to Lake Chapala and its water quality have improved since the establishment of the river basin council, further efforts were deemed necessary. Therefore, in 2000, the Lake Chapala Local Basin Commission (LCLBC) was established with responsibility over all non-Lerma River drainage into the lake. The LCLBC asked that the World Bank and Mexico's National Water Commission help to build a strategy to decrease agricultural water usage in the local drainage area. Through its River Basin Management window, the BNWPP commissioned a user-participation-based study, the goal of which was to help the local farmers think through remedies.

The most important technical recommendation of "Strategy for Water Management Modernization in the Lower Lerma Basin" is that farmers switch to higher-value and less water-intensive crops. Instead of growing wheat and maize, farmers should concentrate on crops like chickpeas. Moreover, the report recommends improvements in water-use efficiencies by lining canals or using low-pressure pipe, land leveling, and by improving on-farm irrigation systems. These improvements will result in less water being lost to evaporation.

But recommendations were also institutional. The study recommends improving measurement and implementing per-volume water fees, and reformation of the system of water rights. Though the Lerma-Chapala Basin does have a viable system of water rights, the quotas are simply too high. Farmers of the area have the right to extract more water than is sustainable, and this over-allocation exacerbates the overuse. The water rights system needs to be improved and better enforced, and existing water rights will have to be renegotiated with the National Water Commission. It is likely that the Mexican government will end up buying some of the farmers' water rights.

While the study's recommendations are important, perhaps more important is the process that was traversed in getting to that point. The participation of water users, working directly with the LCRBC to reach the recommendations, was essential. It built a good deal of water-user ownership into the study's results. Local water users now have a better understanding of how their water usage impacts Lake Chapala and also have a clear plan on how they can contribute to solving the problem. The study therefore represents a model for the rest of the developing world. Douglas Olson, manager for the window, is proud of the user-participation aspect of the project, "It's something that we always aim for, but this time, we actually attained it."

After all, sustainable water use is in the long-term interest of the farmers themselves. Thus, by involving them in every aspect of the study, through meetings and workshops and by having the farmers vet every recommendation, the project not only educated the farmers but also gave them tools by which to address the problems.

Reforming Irrigation Institutions In Andhra Pradesh, India

To support a campaign decentralizing irrigation management in southern India, the BNWPP has lent its expertise in helping solve the complex problems inherent to the reforms. Most importantly, the Reforming Irrigation Institutions window of the BNWPP has helped establish a quasi-competitive mechanism through which efficiency in water allocation and management might be improved.

In the wake of a 1996 drought and consequent farming crises, India's southern state of Andhra Pradesh, under the leadership of its progressive chief minister, initiated a program to decentralize the management of irrigation. In so doing, the state hoped to improve the dismal state of water efficiency, where, in many cases, only 35 percent of the water drawn actually reached the crops that it is meant to cultivate.

Formerly, the state's Department of Irrigation was poorly managed. Tail-enders – those farmers most downstream from the water source – often found their canals dry because lack of proper maintenance led to malfunctioning canal systems, and because users upstream overconsumed water that was either priced too cheaply or was poorly managed and monitored.

Therefore, as a means to decentralize and improve irrigation management, Andhra Pradesh has established about 10,000 Water User Associations (WUAs) state-wide, each with perhaps 100 member-farmers – a number small enough to prevent the rise of inefficient bureaucracies, but large enough to pool political, legal, and financial resources.

However, these changes are enormously complex, and the government of Andhra Pradesh realized that the more expertise in the matter that they could get, the better. Enter the BNWPP's Reforming Irrigation Institutions window.

On the initiative of the World Bank's South Asia department, the Irrigation Reform Window convened the first BNWPP-organized workshop in June of 2001, attended by water experts from around the world, by state and local government officials, and by representatives of the WUAs. The workshop concentrated on integrated water resources management, and also on the complexities involved in India's water reform program.

Reforming Irrigation and Drainage Institutions

The following months saw dramatic – if anecdotal – evidence of a rapidly improving water allocation system. Though fee collection levels remained low, tail-enders reported much improved access to water resources. This fact caught the eye of the federal government, so that, by the time the Irrigation Reform Window convened the second BNWPP-organized workshop eight months after the first, the federal government's minister of water resources was there in support of Andhra Pradesh's campaign.

This second workshop addressed "benchmarking," a means through which regulatory efficiency can be measured. Benchmarking is a technique that allows for a form of quasi-competition. By selecting a variety of quantifiable indicators, stakeholders are able to measure the inputs and outputs of a water system over time and compare one water system against another. If done correctly and transparently, incentives can then be tied to statistical performance. As Fernando Gonzalez, manager for the window notes, "Benchmarking will bring efficiency and accountability to systems which are basically monopolistic in nature."

"An opportunity to coordinate cross-cutting expertise within the Bank itself.

The second workshop thus established the indicators that would form the basis of the benchmarking campaign, and a mission followed in which window experts gathered the baseline data for the two areas of Andhra Pradesh mentioned above, and issued a report.

Moreover, as with most BNWPP-supported activities, the lessons learned here will find applicability in other parts of the world as BNWPP experts are invited to other projects. But in a way, global benefits have already accrued: many experts from a variety of countries have visited the Andhra Pradesh project, hoping to glean techniques that might be applied at home.

Managing Sustainable Groundwater Usage in North China

Intensive use of groundwater resources on the North China Plain has generated many social and economic benefits since the 1950s, but the longer-term sustainability of the region's irrigated agricultural development is now seriously threatened by aquifer depletion and salinization. As part of the China Water Resources Conservation project, the BNWPP-funded Groundwater Management Advisory Team (GW-MATE) is working with the national government, the local administration, and stakeholders to mitigate the problem and reach a stable groundwater regime.

The North China Plain – comprising the Hai He plain, and those of the adjacent Huai and Lower Huang river systems – is among the most densely inhabited and most developed parts of China. The area has many major cities including Beijing and Tianjin, and is also the principal national center of wheat and maize production. It is thus worrisome that groundwater levels in the North China Plain Aquifer region have been continuously falling, and it is clear that much more effort needs to be given to establishing a more sustainable water resources policy.

For this reason, GW-MATE has joined with Chinese counterparts to assess the problems and propose practical resource management options, some of which are already being implemented at the county pilot level. The study was the central focus of a June 2002 Groundwater Resource Management Seminar in Beijing, organized by the China Ministry of Water Resources.

The project highlights the problems of the North China Plain Aquifer, where the groundwater is being extracted more quickly than it is naturally replenished. Moreover, current groundwater abstraction and use presents a high risk of aquifer salinization in some areas.

Groundwater Management

A novel aspect of this project in China is that it is promoting real water resources savings, not just improved irrigation efficiency. As Stephen Foster, GW-MATE leader, explains, such a focus requires that "the water consumption by evapotranspiration in the overall cropping and irrigation process is reduced while minimizing impacts on crop yields, and farmers agree not to use the water saved to extend the irrigated area." Moreover, the project takes a bottom-up approach to water resources management, working with county-level bureaus and local water users. "No water-user participation means no real groundwater management," the project managers contend.

In this regard, the decentralized nature of the existing water resources regulatory system is helpful. However, the aquifers in question are very extensive, and it is clear that broader systems of resource regulation will be needed at the provincial level. As such, GW-MATE has proposed the establishment of coherent groundwater management areas (which recognize natural boundaries) in order to form a more rational basis for the practice of integrated water resources management.

But while new institutional arrangements will have to be developed, much more consistency needs to be achieved within existing regulatory efforts. GW-MATE found, for example, that while groundwater abstractors are required to have permits, there does not appear to be much correlation between estimated water resource availability and the quantities authorized for abstraction in these permits.

The GW-MATE warns that "serious socioeconomic impacts…. are likely to be experienced from the continuation of essentially uncontrolled abstraction," and argue that water users must be much more involved in the resource management process. While Water User Associations (WUAs) have begun to appear on the North China Plain, their task is usually narrow – to participate in the operation and management of irrigation systems. On the other hand, in some counties, groundwater management committees are beginning to consolidate the participation of the various user sectors, but mainly through government representatives. GW-MATE recommends that WUAs be invited to these committees, along with representatives of industry, urban centers, and other users. Such integration is essential if the region's groundwater resources are to be efficiently used and sustainably managed in the long run.

The project highlights the problems of the North China Plain Aquifer, where the groundwater is being extracted more quickly than it is naturally replenished.

Water Quality Management in Brazil

Following a Brazilian initiative for better management of water resources, the BNWPP has supported a team of specialists to work with Bank staff, as well as state and federal officials in examining environmental issues related to water quality. The focus is on developing an integrated, cross-sectoral approach to wastewater management.

Over the past decade, the Bank and other international financial institutions have supported Brazil in addressing water resources, sanitation, and environmental issues through sectoral and cross-sectoral projects. The record on these has been mixed, with tensions arising between the efficiency of focused work and the fundamental need for cross-sectoral approaches to water resources management and the environment.

In the vein of the latter cross-sectoral approach, Brazil's National Water Agency has launched an innovative strategy to rationalize water management in and between the country's states. In Brazil, as in many other countries, water resources decisions have frequently been disconnected from water quality issues, and water companies have often ignored environmental regulations seen as unrealistic. Without coordination between those with regulatory responsibility over water resources and those with regulatory authority over wastewater and the environment, costs increase and the provision of public services suffers.

Recognizing the scale and national importance of the problem, the federal government, through the National Water Agency, has promoted the establishment of River Basin Committees whose jurisdictions cover hydrological units, rather than state and regulatory boundaries. It has also introduced a novel system for linking the issuance of permits for both quantity and quality aspects. These River Basin Committees are intended to serve as a mechanism to balance different interests and to help establish coherent policies and responsibilities.

Wastewater Management

The Brazilian government sought the support of the Bank in thinking through issues that link water resources management, sanitation services, and environmental management. Since Bank staff were already reviewing the institution's experience in complex water resources and sanitation projects, they saw an opportunity to share and coordinate cross-cutting expertise within the Bank itself.

"By having our own sectoral specialists working together in addressing these questions, we are in a much better position to support the Brazilian government in its efforts to tackle water resources in a more integrated way," said David Hanrahan, manager of the Wastewater Management window.

A good example of the complexities involved is the case of the recent Guarapiranga Reservoir Project, which Bank staff and experts reviewed with local officials. Growing urbanization in São Paulo has increased the competition between water supply and power generation; it also threatens the quality of the water in the main reservoir because of the uncontrolled, informal growth of settlements in the catchment. Despite the serious challenges, the Bank-supported project to protect the reservoir has been largely successful because of common objectives of all the sectors, from environmental regulators to water utilities. Other "integrated" projects examined were less successful, however, particularly where the different sectors had priorities that were not consistent with the overall objective.

Bank staff and other water experts are discussing the draft report with Brazilian government authorities with an aim to better take into consideration cross-sectoral complexity in addressing water quality management. The final report should be applicable inside and outside Brazil, and will provide insights on policy choices and project design, helping to achieve more rational and environmentally sustainable water management.

WITHOUT COORDINATION BETWEEN WATER RESOURCES, WASTEWATER, AND THE ENVIRONMENT, COSTS INCREASE AND PROVISIONS OF PUBLIC SERVICES SUFFERS.

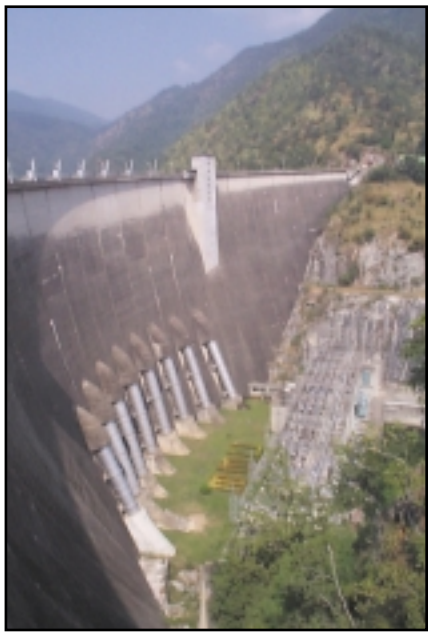
Improving Dam Safety Through Regulatory Reform

This BNWPP-funded sourcebook gives countries a "menu" of options by which they might implement and rationalize safety regulations for dams. The objective is not only to prevent catastrophic accidents, but more generally to help countries achieve more efficient delivery of dam services and reduce financial costs associated with providing such services.

"IT'S NOT SO MUCH ABOUT THE CATASTROPHIC SCENARIOS, BUT ALSO ABOUT REDUCING COSTS WHICH HINDER THE OVERALL OPERATION OF THE DAM."

The World Commission on Dams estimates that there are over 45,000 large dams worldwide. Given that the failure of a dam can have catastrophic social and environmental consequences, and given that developing countries often lack adequate financial, technical, and regulatory resources, the commission chose to highlight dam safety in its well-known 2000 report.

In concert with the priorities of the World Commission on Dams, the Dams Planning and Management window of the BNWPP commissioned a report examining the regulatory options available to developing countries. Promotion of regulatory competence in Bank operations is of utmost importance.



The authors of Regulatory Frameworks for Dam Safety emphasize that this report is not the usual guidelines-oriented document, but that it rather draws on the global and diverse reach of the World Bank's experience with dams, surveying and assessing existing regulatory systems in 22 countries, and providing a "menu" of options based on this experience. In this way, technical experts and policymakers can actually see the modus operandi of different regulatory mechanisms, their advantages and drawbacks, and assess for themselves the degree of applicability a given policy might have in their own locale. This provides real-world advantages over vague, generic guidelines, which are useful in theory, but often provide only marginal assistance when applied.

After surveying the existing regulatory systems in 22 countries, the report goes on to categorize and analyze the countries' existing regulatory structure. The result is a conclusion separated into three parts.

First and arguably most important are the essential elements distilled from the practices of the countries involved in the survey. For example, the authors find it crucial that the regulatory authority responsible for dam safety be unambiguously identified and its powers and responsibilities clearly spelled out.

Second, the book provides desirable elements of dam safety. For example, as part of a process for obtaining a dam license, prospective dam owners should be required to conduct a failure impact assessment.

Third are the emerging trends – cutting-edge policies that a given country may find helpful in improving existing frameworks. Among these is making dam owners more responsible and more liable for dam safety while simultaneously reducing the responsibilities of the regulating agency.

The benefits of the report are expected to be several. First, though prevention of an actual dam failure is important, other benefits also accrue when the risk of dam failure is reduced. Insurance costs are minimized, and contractors are more willing to become involved in dam operations if they feel there are adequate safety measures and accountability for safety is clearly delineated. According to Richard Davis, co-task manager for the Dams Planning and Management window, "It is not so much about the catastrophic scenarios, but also about reducing costs which hinder the overall operation of a dam."

Secondly, issues of safety often dovetail into issues of efficiency and cost reduction. Just as pothole-free roads lessen the risks of car accidents, reduce the frequency of auto repairs, and increases the efficiency of the highway system, so too does better safety maintenance lead to cost savings and a more efficiently run dam. And, with more efficient dams, demand for the construction of new dams will be lessened and the impacts on the environment and local populations mitigated.

Much is expected from the report, which is scheduled for publication in the Fall of 2002. The authors expect it to be of particular use in the countries of the former Soviet Union whose regulatory mechanisms have been fundamentally altered in the past decade and many of which do not have a single regulatory agency responsible for dam safety. The report is currently being translated into Russian for this purpose and will be made available on the BNWPP website.

Understanding the Dynamic Links Between Ecosystems and Water in the Mekong Basin

The Mekong River provides livelihoods to millions of people in the entire basin. Proper planning is therefore important to ensure that downstream water, land, and aquatic resources are managed properly in conjunction with major upstream developments of water resources. Rice production in Vietnam's delta and an important fishery that provides the bulk of protein for Cambodia, could both be affected by changes in the quantity and quality of water in the basin. In response to a request from the Mekong River Commission, the Environmental Flow window of the BNWPP is helping the Commission develop a framework to understand the environmental needs of the basin – how changes in water flow and quality might affect the ecosystem and the humans that depend on it.

In 1995, the four riparian countries of the Lower Mekong Basin – Cambodia, Laos, Thailand, and Vietnam – entered into an agreement to cooperate on sustainable development of the basin. In the process, the Mekong River Committee, which had acted much as a channel for development funding, was transformed into the Mekong River Commission (MRC), which set itself on course to become a river basin management organization, primarily concerned with issues of basin-wide importance.

Having learned of similar work the World Bank had done in Lesotho, the MRC invited an Environmental Flow window expert to give a presentation at a MRC workshop introducing the concepts of environmental flows and environmental flow assessment, the latter as a possible unifying framework for assessing the uses of water for ecosystem functions and services.

Environmental Flow

The concept of environmental flow assessment is complex. Unlike the determination of water for urban, rural, industrial, agricultural and energy supply which is fairly straightforward and well known, the determination of water quantity and quality needed to sustain an ecosystem is enormously complicated. Changes in water depth, flow, velocity, temperature, salinity, or wetter parameters can dynamically impact ecosystem fauna and flora, possibly harming the humans, livestock, and other resources that depend on them.

Through pro-active efforts, the MRC is preparing the ground for understanding the impacts of future upstream development such as the proposed hydropower projects in China and Laos. These efforts will promote the protection of important downstream resources such as the Tonle Sap (the Great Lake) fishery, which is the main protein source for the Cambodian people and up to 60 million people in the basin. Determination of how water impacts the health of the fishery is vital, not just for fish themselves, but for the human population dependent on them. An environmental flow assessment can assist in the design and operation of dams for multiple uses.

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But while the Tonle Sap fishery is arguably the most pressing case, there are myriad other environmental issues important to the basin. There is concern, for instance, that severe deforestation in Thailand may be contributing to increased flash floods (with higher flood peaks) in the rainy season, and drought conditions and salinity intrusion into the delta in the dry season, threatening rice production there. Increased abstraction for irrigation in Vietnam may also be contributing to salinization. Needless to say, the dam projects upstream could similarly exacerbate salinization of the Mekong by affecting its flow.

In response to the initial Environmental Flow window support, the MRC is considering the use of environmental flow assessments as a possible 'unifying framework' for assessing the ecosystem needs as part of the river basin management. The window support for the MRC is an example of how good practice from one place (Lesotho) can be useful in another (the Mekong Basin).

Assessing Causes and Measuring Consequences to Prevent Flooding in Lagos, Nigeria

Repeated flooding in Lagos, Africa's largest city, scares away the private investment that the city so badly needs and causes extensive damage to personal property and public infrastructure. In support of a larger project to increase the effectiveness of Lagos' infrastructure, the BNWPP's Flood Management window embarked on an effort to discuss with the Lagos State authorities the causes, consequences, and possible remedies of the flooding problem. This discussion resulted in a study aimed at providing good baseline data from which progress in drainage services can be measured.

The economic hub of Africa's most populous country, Lagos has experienced rapid growth in recent years. It is estimated that one out of every ten Nigerians live in Lagos, and that the city will become the world's third largest by 2015. But with growth comes growing pains. Persistent problems in infrastructure have hampered efforts to maintain economic stability and have discouraged the investment Nigeria so urgently needs.

Recognizing this problem, under the auspices of the Lagos Metropolitan Development Project, the Bank with BNWPP support sponsored a workshop addressing the important issue of infrastructure development. Part of the workshop dealt with the persistent problem of flooding in Lagos, which then became the genesis for a BNWPP study to assess the extent and nature of the flooding problem in the city. But more than that, the workshop focused on establishing "performance indicators," at once assessing the causes of the flooding problem and providing a basis by which to assess progress.

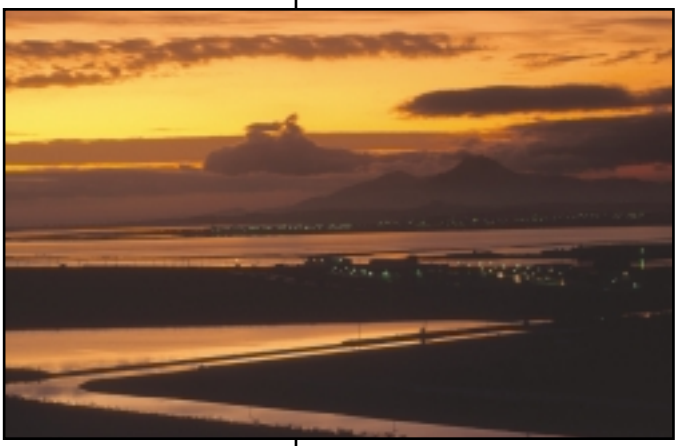
The result was a survey-based study that asked a sample of businesses and common citizens their assessment of the causes and consequences of the drainage problem. The product is elegant and convincing. Says Luitzen Bijlsma, task manager for the Flood Management window: " With the rapid growth of the city, the Bank lacked real baseline knowledge of what was happening in drainage services … Baseline information on performance indicators is needed to measure progress and achieve accountability for the Bank in its lending procedure, and is even more important for the Lagos State Government to organize and govern its services."

Perhaps because of a lack of access to municipal waste removal services, citizens frequently use sewers as a place to dump their refuse. Naturally, this clogs the drainage systems and leads to flooding, which in turn causes much property damage, wreaks havoc on other infrastructure (erosion of roads, for example), and even leads to some deaths.

Normally, when confronted with infrastructure problems, the reaction is to simply build more infrastructure. By contrast, this study focused on ways that current drainage services might be reorganized to increase the efficiency of the system. For instance, surveyors asked their respondents whether and how much they would be willing to pay for reliable services that would remove waste from the drains. In so doing, the survey establishes a basis from which policymakers can assess the financial feasibility of such services. Moreover, the report of the survey, instead of recommending that more sewers be built, suggested that the government focus on providing citizens access to waste removal services and carry out an education campaign.

But perhaps of most importance is that the study, while conducted in Lagos, can be applied to other areas around the world with similar problems.

...THIS STUDY FOCUSED ON WAYS THAT CURRENT DRAINAGE SERVICES MIGHT BE REORGANIZED TO INCREASE THE EFFICIENCY OF THE SYSTEM.



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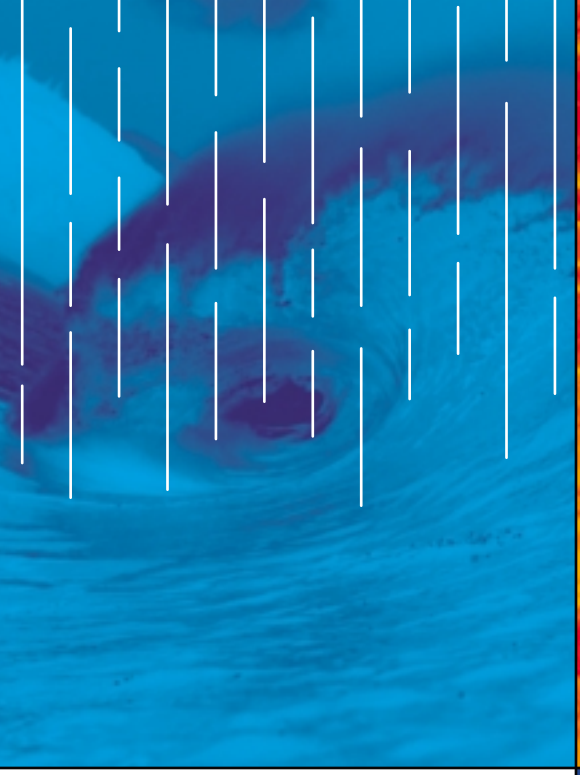

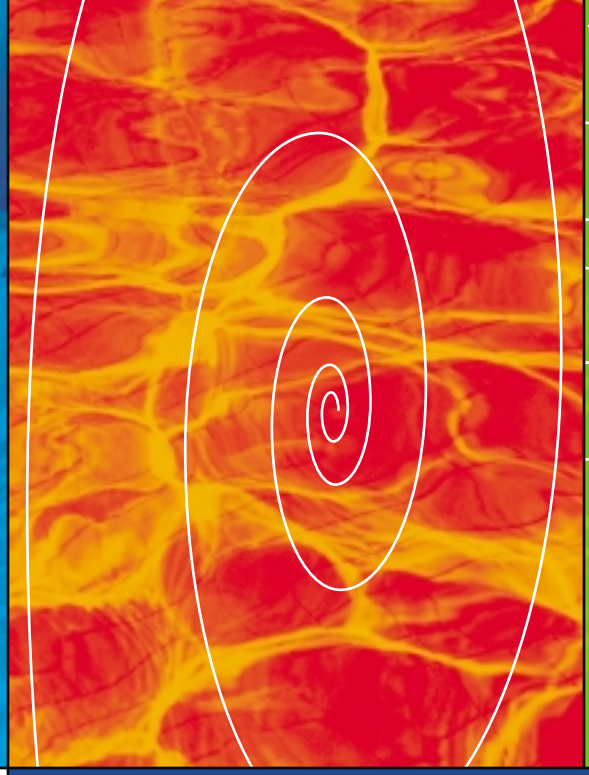

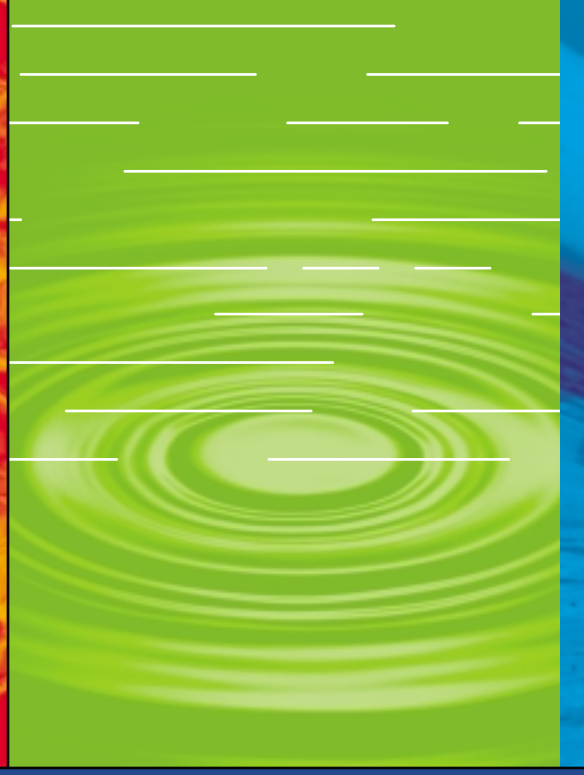

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