Water Resources Management

The World Bank
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Executive Summary

Water resources have been one of the most important areas of World Bank lending during the past three decades. Through its support for sector work and investments in irrigation, water supply, sanitation, flood control, and hydropower, the Bank has contributed to the development of many countries and helped provide essential services to many communities. Yet, as pointed out in reports of the Operations Evaluations Department, the investments supported by the Bank in the areas have often encountered implementation, operational, and social problems. Underlying these problems is a vicious cycle of poor-quality and unreliable services that result in consumers' unwillingness to pay, which, in turn, generates inadequate operating funds and a further deterioration in services. Moreover, the Bank and governments have not taken sufficient account of envirorunental concerns in the management of water resources.

The difficulties encountered by Bank-supported projects reflect a larger set of problems faced in water resource management, which are highlighted in the *World Development Report 1992: Development and the* Environment (1992d). Water is an increasingly scarce resource requiring careful economic and environmental management. The situation is exacerbated by rapid population growth and urbanization in developing countries. As the demand for water for human and industrial use has escalated, so has the competition for water used for irrigated agriculture. At the same time, the engineering and environmental costs are much higher for new water supplies than for sources already tapped. New challenges call for a new approach. Governments have often misallocated and wasted water, as well as permitted damage to the environment as a result of institutional weaknesses, market failures, distorted policies, and misguided investments. Three problems in particular need to be addressed:

- Fragmented public investment programming and sector management, that have failed to take account of the interdependencies among agencies, jurisdictions, and sectors
- Excessive reliance on overextended government agencies that have neglected the need for economic pricing, financial accountability, and user participation and have not provided services effectively to the poor
- Public investments and regulations that have neglected water quality, health, and envirorunental concerns.

To manage water resources more effectively, a balanced set of policies and institutional reforms should be sought that will both hamess the efficiency of market forces and strengthen the **capacity** of governments to carry out their essential roles.

A Framework for Improving Water Resource Management

The proposed new approach to managing water resources builds on the lessons of experience. At its core is the adoption of a comprehensive policy framework and the treatment of water as an economic good, combined with decentralized management and delivery structures, greater reliance on pricing, and fuller participation by stakeholders. The proposed approach is consistent with the Dublin Statement (1992) from the hitemational Conference on Water and the Envirorunent as well as with Agenda 21 from the 1992 United Nations Conference on Environment and Development.

Needfor a comprehensive framework

The adoption of a comprehensive framework for analyzing policies and options would help guide decisions about managing water resources in countries where significant problems exist, or are emerging, concerning the scarcity of water, the efficiency of service, the allocation of water, or environmental damage. The complexity of the analysis would vary according to the country's capacity and circumstances, but relatively simple frameworks can often clarffy priority issues. The framework would facilitate the consideration of relationships between the ecosystem and socioeconomic activities in river basins. The analysis should take account of social, environmental, and

economic objectives; evaluate the status of water resources within each basin; and assess the level and composition of projected demand. Special attention should be given to the views of all stakeholders.

The results of the analyses at a river basin level would become part of the national strategy for water resource management. The analytical framework would provide the underpinnings for formulating public policies on regulations, incentives, public investment plans, and environmental protection and on the interlinkages among them. It would establish the parameters, ground rules, and price signals for decentralized implementation by government agencies and the private sector. Decentralizing the delivery of water services and adopting pricing that induces efficient use of water are key elements of sound water resource management. But, for decentralized management to be effective, a supportive legal framework and adequate regulatory capacity are required, as well as a system of water charges to endow water entities with operational and financial autonomy for efficient and sustainable delivery of services.

Country focus of the policy

The comprehensive analytical framework outlined above will need to be tailored to the situations and constraints facing individual countries. Many of the countries with limited renewable water resources are in the Middle East, North Africa, Central Asia, and Sub-Saharan Africa, where populations are growing fastest. Elsewhere, water scarcity may be less of a problem at the national level but is nevertheless severe in many areas such as in northern China, western and southern India, western South America, and large parts of Pakistan and Mexico. For some countries, such as those in Eastern Europe, pollution is the largest problem affecting water resources. In much of Africa, implementation capacity is a critical issue exacerbated by the frequency of prolonged droughts. In some countries, water resource management is not yet a significant problem. These differences among regions and countries will shape the design of strategies and programs for a given country.

Waterpolicy objectives

Differences among countries notwithstanding, water resource management that follows the principles of comprehensive analysis, opportunity cost pricing, decentralization, stakeholder participation, and environmental protection outlined in this volume will yield more coherent policies and investments across sectors, promote conservation, and i-Tnprove the efficiency of water allocation. The objective is to achieve, over time, the following improvements:

- For industry, extensive water conservation and protection of groundwater sources. Experience in industrial countries suggests that controlling pollution will also substantially reduce the quantity of water used per unit of industrial output.
- For water suply and sanitation, more efficient and accessible delivery of water services and sewage collection, treatment, and disposal, with the ultimate goal of providing universal coverage. this will be achieved by extending existing supplies through water conservation and reuse and by using other sustainable methods. Greater involvement of the private sector, nongovernmental organizations, and user groups will be required, as will cost recovery to ensure financial viability while applying graduated fees to assist the poor.
- For irrigation and hydropower, modernized irrigation practices, greater attention to cost recovery, drainage and salinity control, measures to reduce pollution from agricultural activities, improvements in operation and maintenance of existing systems, and investements in small-scale irrigation and various water-harvesting methods. This calls for the development of institutuions and technologies that respond to the needs of farmers for higher-quality services, including greater participation of community groups and user associations, while reinforcing the efficient management of demand. Particular attention will be given to the needs of small-scale farmers, who comprise most of the agricultural community. Greater priority should be given to managing the demand for energy, identifying small-scale and renewable energy alternatives, promoting watershed conservation practices, and retrofitting and enhancing dam facilities.
- For the environment and poverty alleviation, more rigorous attention to minimizing resettlement, maintaining biodiversity, and protecting ecosystems in the design and implementation of water projects. Water and energy supplies gained through conservation and improved efficiency can be used instead of developing new supplies to extend service to the poor and maintain water-dependent ecosystems. Low-cost and environmentally benign mathods of developing new water supplies for agriculture, rural drinking water, and industry will be pursued.

The water supply needs of rivers, wet lands, and fisheries will be considered in decisions concerning the operation of reservoirs and the allocation of water.

The World Bank Policy

The Bank's overarching objective is to reduce poverty by supporting the efforts of countries to promote equitable, efficient, and sustainable development. This entails support for the provision of potable water sanitation facilities, flood control, and water for productive activities in an economically viable, environmentally sustainable, and socially equitable manner. The new approach is designed to help countries achieve these objectives more effectively while sustaining the water environment, and the Bank will support member goverrunents to that end. The Bank will give priority to countries where water is scarce or where the problems of water allocation, service efficiency, or environmental degradation are serious. In these countries, through its economic and sector work, lending, and participation in international initiatives, the Bank will promote policy reforms, institutional adaptation and capacity building, environmental protection and restoration, and, when requested, cooperation in the management of international watercourses. Because of the crucial interdependencies between water and other sectors, the Bank will incorporate water resource policy and management issues in its country policy dialogues and in the formulation of country assistance strategies where water issues are considered to be significant.

A comprehensive analytical framework

The Bank will encourage and, when requested, selectively help countries develop a systematic analytical framework for managing water resources that is suitable for a country's needs, resources, and capacities The framework will be designed so that options for public water management can be evaluated and compared in the context of a national water strategy that incorporates the interdependencies between water and land use. It will enable coherent, consistent policies and regulations to be adopted across sectors. To facilitate the introduction of such a framework, the Bank is ready to support capacity building through training, demonstrating participatory techniques, and helping in water resource assessments. The Bank will also promote the creation, enhancement, and use of hydrologic, hydrogeologic, socioeconomic, water quality, and environmental data bases for both groundwater and surface water, as well as help governments effectively use this information in decisionmaking.

Institutional and regulatory systems

The reform of water resource management policies will have implications for the institutions dealing with water resources. The Bank will assist governments in establishing a strong legal and regulatory framework for dealing with the pricing, monopoly organizations, environmental protection, and other aspects of water management. Similarly, the Bank will support the adaptation of institutional structures at the national and regional levels to coordinate the formulation and implementation of policies for improved water management, public investment programs, and draught planning. In many countries, isntitutional reform will focus on river basins as the appropriate unit for analysis and coordinated management. Such coordinating arrangements are particularly important in countries with federal structures, in which provincial or state governments have primary authority over the management of water resources in their jurisdictions. In such countries, before comitting funds to support operations that have important interstate effects, the Bank will require legislation or other appropriate arrangements to establish effective coordination and agreed procedures for allocating water. The Bank will also use water resoirce sector loans to coordinate water resource activities across sectors.

Incentives

Many of the problems encountered in providing water services are due to the lack of incentives both for performance by providers and for efficiency by users. A key component of the reforms to be supported by the Bank will thus be greater reliance on incentives for efficiency and financial discipline. The Bank will highlight the importance of pricing and financial accountability by using estimated opprtunity costs as a guide in setting water charges. In practice, immediate adoption of opportunity cost pricing may be politically difficult. Thus, given the low level of current cost recovery and the importance of finances in the sustainability of operations, pricing to ensure financial autonomy will be a good starting point.

Water-conserving technology.

An important element in any strategy to conserve water will be incentives for adopting technologies and management approaches that increase the efficient use, allocation, and distribution of water. Such technologies, and management approaches will make it easier to conserve water, to increase the efficiency of water use and conveyance, and to reuse wastewater. As water scarcity and waste disposal problems become more acute, adopting and improving water conservation practices, wastewater reuse systems, and overall approaches to reduce pollution will become increasingly important.

Poverty alleviation

Inadequate water services have a particularly adverse impact on the poor, facilitating the spread of disease, especially in crowded low-income areas. Thus, special efforts will be directed to meeting the water needs of the poor. Moreover, the health benefits of better hygiene and clean water should be emphasized so that the advantages of having an improved water supply can be fully realized. Where public finance is scarce, significant additional resources can often be mobilized within local communities. Efforts should be made to determine the level of services actually wanted by the poor. Research and experience suggest that the poor are willing to pay for reliable service. Indeed, in the face of unreliable service, the poor often pay more for less water, which they typically receive from street vendors. Water entities that have a financial stake in serving the poor are more likely to provide them with better, more sustainable services. "Social fees," whereby the better-off crosssubsidize the poor, as well as budgetary transfers to subsidize connections can be used. However, caution is required. Assigning noncommercial objectives to a public enterprise may undermine the achievement of its service objectives, possibly initiating a new round of the vicious cycle of unsatisfactory service and low collections. Policies that affect or change water rights should be carefully evaluated to ensure that they do not harm the poor, since water rights are often crucial for generating income. Where necessary, adjustments should be accompanied by compensatory measures.

Decentralization

Because of their limited financial and administrative resources, governments need to be selective in the responsibilities they assume for water resources. The principle is that nothing should be done at a higher level of government that can be done satisfactorily at a lower level. Thus, where local or private capabilities exist and where an appropriate regulatory system can be established, the Bank will support central govemment efforts to decentralize responsibilities to local governments and to transfer service delivery functions to the private sector, to financially autonomous public corporations, and to community organizations such as water user associations. The privatization of public water service agencies, or their transformation into financially autonomous entities, and the use of management contracts for service delivery will be encouraged. Arrangements for ensuring performance accountability putting in place an appropriate regulatory framework to set and e environmental protection standards and to prevent inefficient monopoly pricing will be incorporated into Bank-supported activities. These steps should improve incentives for cost recovery and service pr and give users a sense of ownership and participation. In countries where provincial or municipal capabilities are inadequate to manage complex system of water resources, the Bank will support training and capacity building to improve local management so that decentralization can eventually be achieved.

Participation

Participation is a process in which stakeholders influence policy formulation, alternative designs, investment choices, and management decisions affecting their communities and establish the necessary sense of ownership. As communities increase their participation in managing water resources, project selection, service delivery, and cost recovery will likely improve. Therefore, the Bank will encourage the participation of beneficiaries and affected parties in planning, designing, implementing, and managing the projects it supports. In environmental assesments, the Bank requires consultation with affected people nongovernmental organizations, and will additionally promote the participation of concerned people-including the poor, indigenous people and disadvantaged groups-in the water-related operations it supports. Special attention will be given to the participation of women they are essentially the managers of domestic water. The Bank encourage governments to follow these principles more broadly in their investment programs and other activities related to water resources.

Environmental protection

Preservation of the environment and the resource base are essential for sustainable development. The protection, enhancement, and restoration of water quality and the abatement of water pollution will therefore be a focus of Bank-supported operations, particularly since providing safe drinking water is so critical to maintaining and improving human health. Accordingly, the Bank will increase its support of governmental efforts to improve and expand sanitation and the collection and treatment of wastewater. Similarly, the Bank will promote the use of efficiency pricing and "the-polluter-pays" principle through the imposition of pollution charges to encourage water conservation and reduce pollution. For industrial waste, mining runoff, and wastewater discharge, a balanced strategy involving economic incentives, effective legislation and regulatory systems, and guidelines for levels of pollution control will be used to reduce effluents at the source especially toxic substances-and to stimulate reuse. For pollution originating from agricutural activities, the Bank will support initiatives that restore and protect surface and subsurface waters degraded by agricultural pollutants and that minimize soil erosion. The Bank will assist governments in developing strategies and cost-effective mechanisms for the ecologically sustainable management, protection, and restoration of recharge areas and water-dependent ecosystems, such as wetlands, riverine floodplain areas, estuaries, and coastal zones. Investments that involve resettlement should be avoided or minimized, and, where resettlement is necessary, former incomes and living standards should be restored or improved Given the increasing importance of groundwater, especially in arid and an semiarid areas, the Bank will pay attention to the linkages between ground and surface water in managing river basins and will support the establishment of government programs and policies, including land use policies, that restore and protect the quality of groundwater and preserve groundwater recharge areas.

Upgrading skills

In tandem with the promotion of a comprehensive framework and with institutional and policy reforms, country policy analysts, planners, managers, and technicians will need to upgrade their skills. Accordingly, where water resource management issues are significant, the Bank will support the training needed to deal with cross-sectoral analysis; with legal, regulatory, and privatization issues; and with river basin management, flood and drought planning, environmental protection, project formulation and evaluation, demand forecasting, and participatory management. The Economic Development Institute of the World Bank will be an important element in this training effort, through a special initiative to support the implementation of the new policy.

Designing country programs

Countries differ in their water requirements and endowments, their poverty profiles, their institutional capacities, and the problems they face from environmental degradation. Thus, the design of relevant forms, and the time frame for implementation, will need to be developed and evaluated case by case. Nonetheless, introducing the recommended reforms will typically entail difficult political choices, and commitments by governments will therefore be essential. Given the present status of water resource management and institutions in many countries, implementing the necessary changes will take time. Accordingly,

- In countries with significant water management problems, the Bank will, in collaboration with other international and national agencies, assist governments through sector work, technical assistance, and environmental action plans in identifying and formulating priority policy and institutional reforms and investments and in determining their appropriate sequencing. These priorities-and the degree of government commitment to them-will be highlighted in the country assistance strategy and will guide the sectoral lending program.
- The priority reforms and activities to be addressed in analytic work and referred to in the country assistance strategy will deal with issues such as the appropriate (a) incentive framework and pricing, (b) service delivery to the poor, (c) public investment priorities, (d) environmental restoration and protection, (e) water resource assessment and data requirements, (f) comprehensive analytical framework, and (g) legislation, institutional structures, and capacities. Assessing the degree of govenunent commitment to implementing the requisite reforms will be an important part of the analysis.
- Progress in implementing the identified priorities will be monitored through normal Bank interactions with the country. When inadequate progress on priority actions is judged to cause serious misuse of resources and to hamper the viability of water-related investments, Bank lending in this area will be limited to providing potable

water to poor households and to operations designed to conserve water and protect its quality without additionally drawing on a country's water resources. Such operations include sanitation, waste treatment, water reuse and recycling, abatement of water pollution, drainage, and rehabilitation of the distribution systems. These investments will be assessed on their individual merits.

- Individual water lending operations should discuss the linkage to priorities for reform, investment, and Bank support as well as the likely impact of the overall water-related program. The analysis of operations will include an assessment of the implications for other water-using subsectors within the relevant regional setting, most likely a river basin. Relevant pricing issues, cost recovery, and financial autonomy and sustainability will receive particular attention. The rationale for institutional arrangements for implementation, particularly the division of responsibilities between government and nongovernmental or financially autonomous entities, will be provided. The Bank requires the assesment of the environmental assessment of the entire river system for significant water-related projects, and full consultation with affected people and local organizations.

International watercourses

Existing guidelines describe Bank policy on the financing of projects dealing with international waterways. The Bank, together with other international organizations, will help countries improve the management of shared international water resources by, for example, supporting the analysis of development opportunities forgone because of international water disputes. Through technical, financial, and legal assistance, the Bank, if requested, will help governments establish or strengthen institutions, such as river basin organizations, to address transnational water management activities. Furthermore, the Bank will support studies and consultations to review available organizational arrangements and help countries develop alternative solutions. In initial contacts with riparians, the Bank will avoid setting preconditions, exploring instead the most appropriate form of assistance. The Bank will be sensitive at all times to the interests of other riparian parties, since all parties must be treated in an even-handed manner. The focus will be on international watercourses in which the Bank's assistance is likely to have a substantial effect. In addition, the incremental cost of actions taken by riparian states to protect international water resources and river basins will continue to be financed within the framework of the Global Environment Facility. The Bank will promote the acquisition of knowledge concerning internationally shared groundwater to provide a basis for establishing guidelines governing the Bank's activities in this area.

Implementation

To help implement its water resource management policy, the Bank will undertake a range of activities, including the preparation of guidelines and best-practices papers, staff and country training programs, capacity building, and the development of coordination mechanisms to improve the management of water resources. More specifically, in collaboration with the United Nations Development Programme, a guide on capacity building is being prepared for countries interested in formulating strategies for managing water resources. Guides are also being prepared on establishing water resource information systems, on best practices for setting up coordinating mechanisms, on generalized economic models for river basin analysis, and on best-management practices for water user associations. Regional units are preparing regional water strategies, which incorporate the recommendations of this water policy within the specific circumstances of their areas. The skill mix of available and required Bank staff in the area of water resource management has been analyzed, and training programs, workshops, and seminars are being prepared to upgrade existing staff skills. Pilot projects will be used to implement some of the newer aspects of the water policy such as decentralization and opportunity cost pricing. Finally, the implementation of the new water policy will be reviewed in two years.