

Integrated Water Resources Management in Latin America and the Caribbean

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This paper presents the background research and proposal that supported the development of the Bank's formal strategy (GN-1908-4) on this topic. This paper and the integrated water resources management strategy were both favorably considered by the Bank's Board of Directors on May 27, 1998. The strategy was published in December 1998 (Strategy for Integrated Water Resources Management, No. ENV-125).

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ABBREVIATIONS

ASCE	American Society of Civil Engineers
CELAA	Spanish acronym for Center of Water and Environmental Economics and Law (Argentina)
CESA	Spanish acronym for Ecuadoran Center for Agricultural Services
CESI	Committee for Environmental and Social Impact (IDB)
CRRH	Spanish acronym for Regional Water Resources Committee (Central America)
DSS	Decision support systems
ECLAC	Economic Commission for Latin America and the Caribbean (UN)
EDI	Economic Development Institute (World Bank)
ENV	Environment Division (SDS/IDB)
EVO	Evaluation Office (IDB)
FAO	Food and Agriculture Organization (UN)
GWP	Global Water Partnership
IDB	Inter-American Development Bank
IDB-8	Eight general increase in the resources of the IDB
IFPRI	International Food Policy Research Institute
IHE	International Institute for Infrastructure, Hydraulic and Environmental Engineering (Delft, The Netherlands)
IMA	Spanish acronym for Water and Environmental Management Institute (Peru)
INCyTH	Spanish acronym for National Institute for Water Science and Technology (now changed to National Institute for Water and the Environment, Argentina)
IWRA	International Water Resources Association
IWRM	Integrated water resources management
IWRN	Inter-American Water Resources Network
LAC	Latin America and the Caribbean
MINAE	Spanish acronym for Ministry of Environment and Energy (Costa Rica)
NAFTA	North American Free Trade Agreement
NGO	Nongovernmental Organization
OAS	Organization of American States
ONU	Spanish acronym for United Nations Organization
PAIGH	Pan American Institute of Geography and History
PARLATINO	Spanish acronym for Latin American Parliament
PRISMA	Spanish acronym for Salvadoran Research Program on Development and Environment
Rex/ENx	Generic Environment and Natural Resources Division, Regional Operations Department
RIOC	Spanish acronym for International Network of Basin Organizations
SDS	Sustainable Development Department (IDB)
SEI	Stockholm Environmental Institute
SIDA	Swedish International Development Cooperation Agency
TAPOMA	Task Force for Portfolio Management (IDB)
UN	United Nations
UNDP	United Nations Development Program
UNESCO	United Nations Education, Science and Culture Organization
UNICEF	United Nations Children's Fund
US	United States of America
USAID	US Agency for International Development
WHO	World Health Organization (UN)
WMO	World Meteorological Organization
WWC	World Water Council
WWF	World Wildlife Fund

Executive Summary

Presentation

This paper contains the strategy of the Inter-American Development Bank for its involvement in integrated water resources management in Latin America and the Caribbean. The strategy was developed through an iterative step by step procedure in consultation with country water resource officials, Bank staff, nongovernmental organizations, and international lending and technical assistance organizations. It draws on five background documents, available for consultation in SDS/ENV, the REx/ENx and the IDB Country Offices.

Key Issues

Although the region is well endowed with fresh water resources, and vast and diverse freshwater ecosystems, there are extreme variations in availability within and between countries. Due to rapid population growth and trends in urbanization, tourism, rural development, and other developments, water withdrawals in South America are expected to increase by 70 percent by the year 2025. Already three continental Latin American countries and many cities are facing moderate water stress as measured by the available annual volume of water per capita. Increased demand means that surface and ground water resources as well as coastal areas, especially in small island states, will suffer from increased pollution, increased conflicts between competing uses and between these uses and the environment. As a result, the region's freshwater ecosystems are also under increasing stress.

Current water resources practices cannot deal effectively with these conflicts and are not sustainable from either an economic or environmental point of view. Elements that undermine the sustainable use of this vital resource are subsidized

water delivery by centralized and overextended agencies; emphasis on regulatory approaches through centralized government, rather than markets or other incentive-based approaches; inadequate stakeholder participation; the absence or inadequate enforcement of legislation; inadequate data; scarcity of trained personnel; and a general emphasis on subsectoral, fragmented project-based water resource development without regard to integrated water resource management, including conservation of the environment. As a result, despite massive investments, more than 84 million people in the region still had no access to clean drinking water in 1995, and approximately double that number (over 165 million) had no adequate sewer service.¹

Response

There is a growing consensus in the international water resources community that fresh water is a renewable but finite and vulnerable resource, that its development and management needs an integrated participatory approach at all levels, and that water also has an economic value in all its competing uses and should be recognized as an economic good.

Bank financing of water-related projects has been substantial during the past 35 years (approximately US\$33 billion). According to the Eighth General Increase in the Resources of the Inter-American Development Bank (IDB-8), Bank programs in the water resources sector must reflect the socioeconomic and environmental needs of the borrower countries and serve the interests and needs of water users at the local and community level. Due regard must be given to conservation and sustainable use of all sources of water, taking an integrated management approach using the watershed or river basin as the basic

¹ Approximate estimates for illustrative purposes only.

management unit. IDB-8 also calls for the development and implementation of guidelines on integrated water resources management.

Bank Strategy for Integrated Water Resources Management

The strategy poses a comprehensive, incentive-oriented, participatory and environmentally conscientious approach, and gives operational guidelines for Bank operations in support of the efforts in the region towards a shift from an emphasis on fragmented (subsectoral) to an integrated (sectoral) approach and from an emphasis on development to an emphasis on sustainable management, recognizing the social, economic and environmental value of water, with due participation of the communities and the private sector and due consideration of social equity. These guidelines will enable the Bank to support more efficient ways to allocate water and better ways to resolve conflicts among competing uses. The components of the strategy include its goals and objectives, its guiding principles, the strategic instruments and the IDB instruments and actions. The core of the strategy are its guiding principles: (i) support for the development of national comprehensive water resources policies and strategies; (ii) focus on institutional² innovation and capacity building; (iii) distinguish between and give due attention to both short- and long-term efforts for Bank actions; (iv) conform to Bank's and countries objectives and to internationally accepted principles for integrated water resources management; (v) provide incentives for country involvement and for internal Bank coordination of individual approaches; and (vi) seek cooperation and coordination among international lending organizations. The strategy applies to all Bank projects whether they have a government guarantee

or not.

Supporting Actions

Accordingly, actions to be considered with priority for Bank financing in the water resources sector will:

- a. Develop or strengthen national water resource policies and strategies that recognize the social, economic and environmental value of water and the need for sustainable management, with the participation of communities and the private sector.
- b. Provide comprehensive water resources assessments, including definition and fulfillment of common standards, integrated planning by river basins with cost recovery mechanisms, market-based and other incentive-based allocation mechanisms, and mechanisms for community and private sector participation and for resolution of conflicts with due regard for social equity and ecosystem conservation.
- c. Facilitate adjusting the institutional framework, when needed, to enable and promote coordination and integration between water subsectors and between these and the environment, including adequate legislative frameworks and mechanisms for compliance
- d. Seek innovative ways to finance water resource data acquisition and exchange networks, human resource development and other capacity building needs, with particular attention to ground water and water quality assessments, water use and water demands, and assessments of freshwater ecosystem characteristics and functions.
- e. Support innovative project approaches that focus on integrated water resource management, conservation, pollution prevention and ecosystem conservation.

² As used in this paper, "institutional" refers to laws, customs, regulations, and the agencies and organizations that enforce and manage. Sometimes, when additional emphasis on laws is desired, the term "laws and institutions" is used.

Introduction

This paper contains the *strategy of the Inter-American Development Bank for its involvement in integrated water resources management in Latin America and the Caribbean*, in response to the mandates of the Eighth General Increase in the Resources of the Bank.

The strategy was developed through an iterative step by step procedure in which country water resources officials, Bank upper and middle management and technical staff, consultants, non-governmental organizations and international lending and technical assistance organizations were consulted.

The strategy draws from a background paper and initial exploratory survey made in six LAC countries by two consultants commissioned by the Bank³ and discussed at the seminar on the subject held at IDB headquarters in November 1995 with the participation of staff from the Bank, USAID and other Washington-based international lending and technical assistance organizations. A strategy profile was then presented to the Policy Committee of the Board and consulted with Washington-based environmental NGOs and organizations.

Six more thematic short papers were then commissioned⁴ and discussed with Bank staff, US and international organization representatives,

officials from all LAC countries and invited NGOs⁵ at the Bank-convened workshop (81 participants), and subsequent IDB/World Meteorological Organization (WMO) Latin America and the Caribbean Water Resources Assessment and Management Conference⁶ held in San José, Costa Rica in May 1996.

Following the recommendations of the participants at these meetings, an international NGO⁷ was commissioned to undertake an additional background paper covering fresh water ecosystems. In addition, four researchers were invited to present short thematic papers on economic instruments for integrated water resources management.⁸ These papers were presented and discussed in a seminar held at IDB headquarters on December 2, 1996, with the participation of the authors, invited panelists from IFPRI, ECLAC, the World Bank and IDB,⁹ and Bank staff.

The strategy also benefits from comparisons with experiences and recommendations presented at other international forums on the subject, inside

³ William Lord, University of Arizona; and Morris Israel, University of California, Davis.

⁴ Morris Israel, University of California, Davis; Enrique Aguilar Amilpa, consultant, México; Lori Barg, Step by Step NGO, USA; Armando Llop, Director CELAA/INCyTH, Argentina; Miguel Solanes, ECLAC, Chile; Carl Bauer, University of California, Berkeley.

⁵ PRISMA, El Salvador; IWRA, USA; CESA, Ecuador; IMA, Peru.

⁶ 150 participant, including those from the previous workshop.

⁷ W W F.

⁸ Matheen Tobani, World Bank; Delworth Gardner, Brigham Young University; Richard Howitt, University of California, Davis; and Charles Howe, University of Colorado.

⁹ Mark Rosegrant, Miguel Solanes, John Briscoe, Geoffrey Spencer, Larry Simpson and Gabriel Montes.

and outside the region, such as the Global Water Partnership (GWP) meeting sponsored by the World Bank/United Nations Development Program (UNDP)/Swedish International Development Cooperation Agency (SIDA), held in Stockholm in August 1996; the Second Interamerican Dialogue on Water Management sponsored by the Organization of American States (OAS) and the parallel workshop sponsored by the World Wildlife Fund (WWF) on freshwater ecosystems, held in Buenos Aires in September, 1996; and the meeting on Capacity Building in Water Resources held in Delft, The Netherlands, in December 1996, sponsored by UNDP, the Economic Development Institute (EDI) of the World Bank and the International Institute for Infrastructural, Hydraulic and Environmental Engineering (IHE) of Delft. The strategy is also consistent with, and complements, the principles set forth in the Bank's Public Utilities Policy (OP-708) which was recently approved.

This document is organized in two parts and complementary annexes. Part One (Chapters I through IV) presents an overview of water resources in LAC, a summary of Bank financing in the water resources sector, a summary of situations and conditions that justify the shift to integrated water resources management in LAC, and the reasons for the Bank's involvement in support for that shift.

If interested in additional material, the reader is referred to the following *background documents* available at SDS/ENV, the REx/ENx and the Country Offices, prepared as part of the strategy development process:

1. *A Proposed Strategy to Encourage and Facilitate Improved Water Resources Management in Latin America and the Caribbean*, by William Lord and Morris Israel, with the assistance of Douglas Kenney; IDB/SDS/ENV, March 1996.
2. *Proceedings of the Workshop on Strategies for Integrated Water Resources Management*, San José, Costa Rica, May 6-7, 1996, IDB/SDS/ENV, December 1996.
3. *Conference Report and Proceedings of the WMO/IDB Conference on Water Resources Assessment and Management Strategies in Latin America and the Caribbean*, San José, Costa Rica, 8-11 May 1996, WMO-IDB/SDS/ENV, June 1996.
4. *Proceedings of the Seminar on Economic Instruments for Integrated Water Resources Management: Privatization, Water Markets and Tradable Water Rights*, Washington, D.C. December 2, 1996, IDB/SDS/ENV, December 1996.
5. *Integration of Freshwater Ecosystem Conservation into a Comprehensive Water Resources Management Strategy for Latin America and the Caribbean*, by Enrique Bucher, Gonzalo Castro, and Vinio Floris. WWF-IDB/SDS/ENV, December, 1996.

Part Two contains the strategy itself in four additional chapters and a summary. *Chapter V* includes the *objectives* of the strategy, both external and internal to the IDB. That is, the objectives sought by shifting to integrated management of water resources in LAC, as well as those sought by the involvement of the Bank in that process. *Chapter VI* contains the *guiding principles* that comprise the general philosophy for the Bank's involvement and serve as a guide for the development and implementation of the Bank's assistance in the water resources sector. *Chapter VII* deals with well-known *strategic instruments* that can be used to achieve the objectives of integrated water resources management in LAC, within the Bank context. The last chapter, *Chapter VIII*, deals with the use of the main *instruments and actions* that the Bank will use to provide support and assistance for integrated management in the water resources sector. It also includes specific supporting actions for the implementation of the main strategic principles. *Chapter IX* is the summary.

In Part Two, *text boxes* are used to summarize and/or emphasize the conclusions of important paragraphs and/or sections. These text boxes also give the *highlights* and can be read in sequence, to obtain a quick overview of the IDB strategy.

The section on *References* lists the *sources of information* cited in the document. Although explanations are given the first time they are mentioned in the main text, a *Glossary* of the *meaning of terms*, as used in this strategy paper, is also included at the end for those readers who would like to refer to them in a single section of the document. Two *Annexes* include additional explanatory information that *complements* what is presented in the main body of the document.

Finally, it must be said that the strategy is conceptualized as a *continuum* involving a *succession of actions* of a diverse nature, that does not start or end with this strategy paper. It started with the strategy development and consultation process, whose conclusions and resulting actions are reflected in this document. It shall continue with an iterative implementation procedure, whose results ought to be reflected and evaluated in the field. Thus, it will be followed by the development of “good practice” papers, technical papers about specific issues and guidelines for solving integrated water resources management issues within specific operations dealing with water supply and sanitation, irrigation and drainage, flood control, hydroelectric generation, etc., as dictated by the needs of the Bank’s operational regions.

PART ONE: BACKGROUND

I.

An Overview of Water Resources in Latin America and the Caribbean

A. THE WATER RESOURCES SECTOR

1. Introduction

Although water, similarly to the environment, cannot strictly be considered as a sector due to its across-the-board presence in many other sectors, the term water resources sector is helpful for the purpose of looking at water from a hierarchical holistic point of view. Therefore, as used in this document, the term *water resources sector* refers to the portion of the hydrological cycle¹⁰ that provides overall economic, social and life-support functions to all possible needs for water, including economic, social and environmental needs. Although generically it would also encompass coastal and marine brackish and saline waters, by common convention it refers only to major inland surface and groundwater bodies such as rivers, wetlands, lakes and aquifers, mainly of fresh waters and only occasionally, of brackish waters. It does not specifically refer to water in other portions of the hydrological cycle such as precipitation, evaporation and evapotranspiration, or infiltration, although needless to say, they have to be accounted for and may be of similar importance in some specific instances and locations.

2. Latin America and the Caribbean

Latin America and the Caribbean, as a region, with only 8.4 percent of the global population is well

endowed with fresh water resources. The region has an annual runoff average of 13,120 cubic km,¹¹ which represents 30.8 percent of the global total annual runoff average of 42,655 cubic km (Davis, 1996). Although more difficult to quantify, there is also abundant groundwater. The average annual precipitation in the region has been estimated to be in the order of 1,500 mm, over 50 percent of the world average (ECLAC, 1985). Therefore, it is basically a humid region.

However, there are extreme variations in time and geographical availability within and between countries. In Mexico, for example, four major basins that cover about 10 percent of the country account for about 50 percent of the mean annual streamflow. Three South American basins, the Orinoco, the Amazon and the Plata, account for about two thirds of the region's average annual runoff. Almost 25 percent of the land in LAC (some 5 million square kilometers) - corresponds to arid and semiarid regions as a result of the irregular distribution of rainfall (Aldama and Gomez, 1996). These regions are located mainly in northern and central Mexico, northeastern Brazil, Argentina and the Pacific coast of South America from Peru to northern Chile (the Atacama desert in Chile has been labeled the driest place on earth). Smaller areas are also in Dominican Republic and northern Central America.

The mountain systems of the Sierra Madre in Mexico and Central America, continuing into the

¹⁰ Some authors also refer the water resources sector to the "water resources institutions" or to the "water resources industry".

¹¹ These and other similar figures given in this and other Chapters are for illustrative purposes only, and are not the result of any inventory undertaken by the Bank.

Andes mountains in South America, separates the Atlantic and Caribbean slope from the Pacific slope. The major rivers and water bodies of the region such as the Orinoco, Amazon and Plata are in the former, which represents 84 percent of the total area of the region. These rivers drain mainly tropical areas, have small gradients and relatively constant flow in their lower reaches. Large areas in north-eastern Argentina and Paraguay are flat and flood prone. The Pacific slope covers only about 11 percent of the region's area. Its watersheds have steep slopes, many with scant vegetation cover and subject to flash flooding and mud slides and transporting large quantities of sediment. Some five percent of the region—mostly in the high central Andean plateau—has no direct drainage to the oceans (ECLAC, 1985).

Apart from flooding related to tropical cyclones in countries belonging to the Caribbean basin, there are two major types of areas subject to flooding in the region: (i) the lower valleys of major rivers such as the Paraguay and the Parana in Argentina, Bolivia, Brazil, and Paraguay; the Magdalena in Colombia; the Orinoco in Venezuela; the Guayas in Ecuador; and the Beni in Bolivia; and (ii) the lower reaches of mountainous rivers such as those in the Pacific slopes of Central and South America. To give an idea of the importance of these phenomena, the 1983 hydrometeorological events in Bolivia caused losses estimated at US\$836.5 million (Basso, 1995).

Although surface water is important in Belize, Surinam and Guyana and in the island country of Trinidad and Tobago, groundwater provides most of the supplies in many other Caribbean island countries, where the coastal and marine resources cannot be considered in isolation from inland water resources, to the extreme that some small islands are considered, for all practical purposes, as “coastal zones in all their entirety” (Kenny, J.S. et al, 1996).

The major source of supply for the region's water bodies is rainfall. Only south of Latitude 28° S, the high elevation Andean watersheds receive

significant amounts of water from glaciers and melting snow (ECLAC, 1985).

B. WATER RESOURCES SUBSECTORS

1. Principal Subsectors

Those areas of the water resources sector that relate individually to specific economic, social or environmental activities that depend in whole or in part, on water to fulfill their aims and goals, are called the *water resources subsectors*. The principal in the region as a whole are irrigation and drainage, water supply and sanitation including water transport of wastes, and hydropower. Navigation, prevision of natural disasters such as droughts and floods, fisheries, recreation, tourism, conservation of wildlife and of fresh, brackish and saline water ecosystems are also important in some subregions and countries.

2. Water Use by Subsector

The consumptive use of water varies in the region by country and by water subsector. In some large countries such as Mexico, for example, 64 percent of the use is for energy production and 29 percent for agriculture, whereas in some small countries, such as El Salvador, agriculture uses dominate. In some small Caribbean islands, the largest use is for domestic and other forms of water supply.

The manner in which water is used also varies in the region for different subsectors. The subsectors may divert or extract water volumes from rivers, streams, lakes, reservoirs and groundwater. This is called extractive use or water withdrawal. Efficiency of water use also varies between subsectors. For example, the efficiency of use for irrigation (ratio of the water volume actually applied to plants to that withdrawn from a given source) averages 45 percent, and the percentage of water “not accounted for” (total volume of water withdrawn from the source or treatment plant minus the volume of water billed to the user, as a percentage of the total volume withdrawn) varies from 30 percent to 50 percent.

Water is also used without extracting it from its source. The major instream or flow use of water in the region is for hydropower generation, although the dilution and transport of wastes, navigation, recreation, tourism, aquaculture, and the conservation of ecosystems are also important.

3. Water Withdrawals

In 1990, 64 percent of the estimated 152 cubic km per year of water diverted or extracted in South America from water bodies, including reservoirs, were for agricultural purposes including irrigation and stock watering; 18 percent for municipal needs including domestic uses in urban and rural areas; 11 percent for industrial use, including thermal power plant cooling; and even if not a “withdrawal” *per se*, 7 percent represented the amount of water “lost” to evaporation on reservoirs. Not all of the withdrawals result in final consumption. For example, water withdrawn for cooling of thermal power plants, and domestic or industrial use, is usually returned to the river downstream without major loss of quantity, although with significant changes in quality. In contrast, most water withdrawals for agricultural purposes are evaporated or transpired to the atmosphere and are, therefore, temporarily “lost” as a source of supply (Davis, 1996).

In 1990 in South America, 60 percent of the total volume of 152 cubic km per year diverted or extracted was consumed or “lost.” Of these 91.2 cubic km per year consumed or lost, 81 percent was for agricultural uses, 12 percent evaporated from reservoirs, 5 percent corresponded to municipal needs and 1 percent corresponded to industry (Davis, 1996).

It has been estimated that on the average, for each unit volume of used water (domestic and industrial) that is returned to the receiving waters, contamination spoils 8 to 10 equivalent volumes of natural water, requiring large investments to restore its quality and causing large social costs in terms of human health (WMO Secretariat, 1996). Water related diseases are of considerable

significance as causes of both sickness and death in almost any part of LAC.

Despite progress made in some countries to meet demands associated with national environmental regulations and those associated with trade agreements (such as NAFTA) pollution control is, in general, the area where there is least management experience in the region (Lee, 1996). In general, less than ten percent of the municipal wastewater is treated in the region as a whole. Two cases are illustrative of the general situation in the region: four of Mexico’s 218 watersheds receive 50 percent of the total wastewater generated in the country (Aldama and Gomez, 1996), and in Colombia, not more than 5 percent of the 1,155 municipalities provide some wastewater treatment before disposal into receiving waters (Marin, 1996).

There are, therefore, unfulfilled needs and great challenges in this area that will demand large investments. Also, adequate answers to important questions about the economic efficiency, continuity and financial sustainability of wastewater treatment infrastructure will have to be found given its high cost, uncertain and hard to measure benefits, and financially insolvent executing agencies.

4. Patterns of Use

Water use has not been homogeneous in the region and can be described as highly concentrated in relatively few areas. One general characteristic is that human population (about 90 percent) and human activity is concentrated mainly in the region’s dry and sub-humid zones. Much activity is also concentrated in coastal areas.

Patterns of use have also been non-homogeneous in these areas of concentration. For example, large metropolitan areas such as those around Mexico City, São Paulo and Santiago, and areas of concentrated growth around particular natural resources, such as minerals in Venezuela, had patterns relying heavily on withdrawals and consumptive use, with heavy demands for the transport

of effluents. In rural areas with high population growth rates not out weighted by emigration, the patterns were dominated by withdrawals and consumptive use for irrigation and drainage, and by flood and erosion control. Instream uses other than transport of effluents such as hydroelectric power generation, on the contrary, have generally been concentrated in the more humid areas.

As a result of these patterns, the impact of the major water use subsectors took the form of flow regulation, changes in land use and in vegetation cover, and degradation of water quality and ecosystems, both inland and in coastal areas (ECLAC, 1985 and 1991).

C. MAJOR WATER USE TRENDS

1. Water Stress

Outside of natural year to year variations and in the absence of major global climatic changes, the overall availability of water has been considered to remain constant. However, its availability per capita has decreased with time and its quality deteriorated with use, causing “water stress.” An indicator that has been used to measure the water stress is the annual volume of water per capita. According to a recent report (UNDP/UNESCO, 1995) three continental Latin American Countries are now facing moderate stress. In Peru, for example, availability per capita has decreased from about 4,800 cubic meters in 1955 to about 2,100 in 1990 and is expected to be around 1,050 cubic meters by the year 2025 (Serageldin, 1995).

Recently, a simulation of the most likely future scenarios for water use to the year 2022 was made for the continental freshwater assessment program that is being implemented by the Stockholm Environmental Institute (SEI) with UNESCO and other specialized United Nations agencies (Fernandez, 1996). In this simulation using the model

Globesight,¹² when population was assumed to double and all other conditions remained equal, the results suggested that five more countries would experience water stress. When a projection on deteriorating water quality conditions due to pollution was added, the total number of countries facing water stress increased to fourteen.

2. Water Withdrawals and Consumption

Water withdrawals are expected to continue to increase in the region. In South America, this increase has been estimated to be approximately 70 percent between 1990 and 2025, although not in the same amounts for every water subsector. As for consumption, agriculture, which in 1990 accounted for 81 percent of the water consumed (64 percent of the water withdrawn), is forecasted to decline to 69 percent by 2025, while the largest percentage increases in water consumption are forecasted to be in the industrial sector and evaporation from reservoirs. Nevertheless, agriculture is forecasted to remain as the major water consumer with a projected volume of 84.7 cubic km per year. Evaporation from reservoirs will remain second with a forecasted volume of 24 cubic km per year, ahead of municipal uses which is forecasted as third with an estimated volume of 7.8 cubic km per year, and of industry with 6.2 cubic km per year (Davis, 1996).

3. Water Withdrawal Ratio

An indicator used to measure the difficulty of managing limited national water resources is the ratio of water withdrawals as a percentage of water availability on an annual basis. For developing

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Globesight is an integrated computer-based prototype, developed by M. Mesarovic and other researchers in Case Western Reserve University. It belongs to the class of active decision support systems investigated by Y. Takahara et al in “A Hierarchy of Decision making Concepts - Conceptual Foundation of DSS”, J. Of General Systems Theory, 1994.

countries a ratio greater than ten percent generally indicates that water supply is inadequate and significant future investments may be required in the water resources sector. Presently, most LAC countries have a low ratio (less than 2.5 per cent), six countries have a moderate ratio (2.5 percent to 10 percent) and at least four countries (Barbados, the Dominican Republic, Mexico and Peru) have a

ratio over ten percent (Davis, 1996). However, due to the size and diversity of many of the countries and the concentrated patterns of use by the water subsectors, local and regional scarcity can occur at much lower national ratios. Also, some countries are highly dependent on trans-boundary waters, given that the origin of most of their water resources is not within their territory.

II. Bank Financing of Water-Related Projects

Table 1 and figure 1 show that the Bank has been active in the water sector since its creation.

The figures for sanitation include water-related projects in the Bank categories of basic sanitation, water supply, sewerage and pollution control projects. "Other" includes water-related projects in watershed management, integrated rural development, flood control, and waterway projects.

Investments in hydroelectric projects dominate over the 35-year period, followed by investments in sanitation projects. Hydroelectric investments started gradually and became dominant during the 15-year period from 1971 to 1985, to decline

appear from the 1997-1999 pipeline.¹³

Investments in sanitation projects dominated during the Bank's early years, to decrease somewhat and then gradually increase to dominate during the 1991-1995 period. This trend is also evident in the 1997-1999 pipeline, where sanitation investments represent about 73 percent of the water-related projects. This may be due, in part, to the large investments in water pollution control projects of recent years.

The "other" category, which includes watershed management projects, appears in 1971 and increases somewhat during the last few years. In

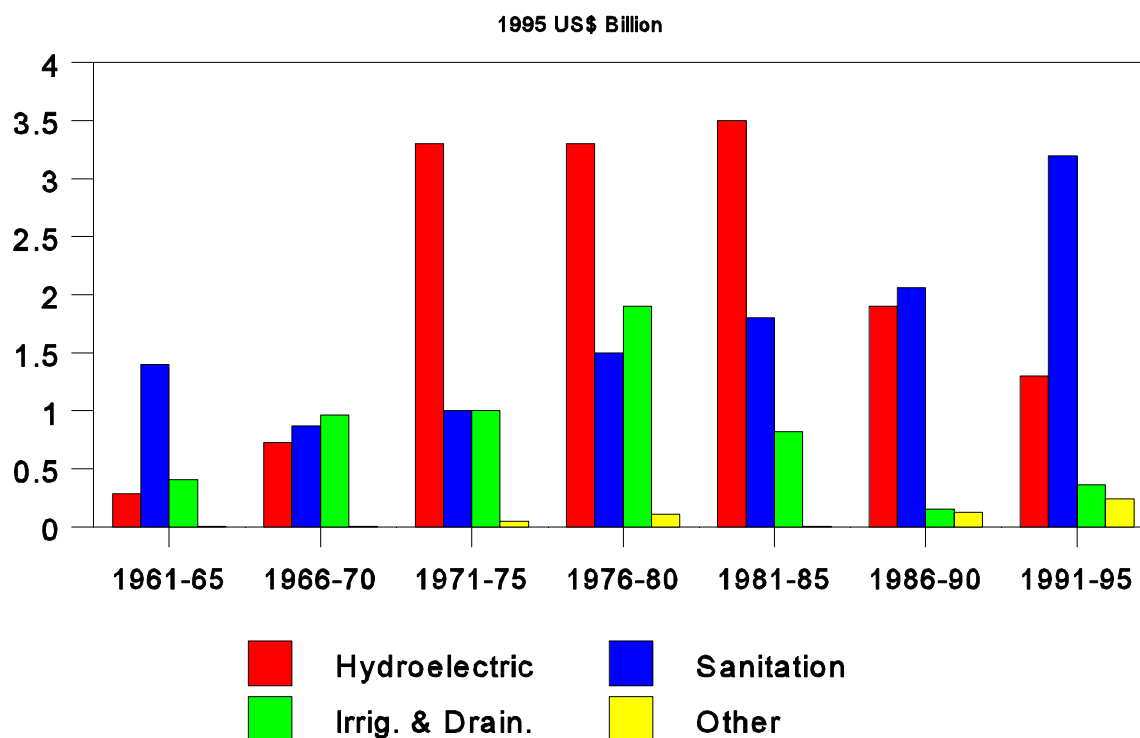
Table 1
Water-Related Projects Approved by the Bank, 1961-1995
(In 1995 US\$ million)

Period	Sanitation	Irrigation and Drainage	Hydroelectric	Other	TOTAL	% of Total Bank Loans
1961-65	1,390	409	283	0	2,082	26
1966-70	873	961	728	0	2,562	23
1971-75	1,036	1,009	3,293	54	5,392	35
1976-80	1,532	1,862	3,262	110	6,766	31
1981-85	1,806	816	3,541	0	6,163	27
1986-90	2,058	147	1,893	123	4,221	25
1991-95	3,191	352	1,298	243	5,084	16
TOTAL	11,886	5,556	14,298	530	32,270	25

somewhat from 1986 to 1995, and practically dis-

¹³ As of October 20, 1997.

Figure 1: WATER-RELATED PROJECTS APPROVED (1961-1995)



the 1997-1999 pipeline, they represent about 12 percent of investments. Investments in irrigation and drainage projects reached their peak in 1976-1980 and show the greatest rate of decrease from there on, representing roughly ten percent of the water-related investments, a proportion that is maintained in the 1997-1999 pipeline.

These investments have mostly been subsectoral and project-based developments; multi-purpose projects were the exception rather than the rule. However, useful lessons have been learned during these past 35 years, and the data yield some interesting trends:

a. Concern for the Watersheds: Most hydroelectric projects were originally conceived without due regard for their relationship with the watersheds in which they were located. This motivated specific recommendations from Bank project evaluations, to integrate water impoundment

projects with regional river basin development, environmental pollution control, and watershed management programs; as well as requiring that investments on hydroelectric projects be the result of, among other considerations, an adequate optimization of river basins, whenever relevant (documents GN-1724 and GN-1551, in IDB/EVO, 1996). The origin of the watershed management projects in the Bank (Paute, Chixoy, El Cajon) responded to an increasing concern of the effect of inadequate land use practices in the upstream watersheds. Although this was a step in the right management direction, the center of attention was still the large infrastructure projects. The watershed management activities were initially conceived as remedial measures for these projects. Later hydroelectric projects have increasingly considered their effects on the environment in general. These concerns evolved from the application of the Bank's environmental policy (OP-703).

- b. Concern for the Quality of Receiving Waters:** Recommendations for incorporating sanitary excreta disposal systems in rural potable water projects were presented as a result of an evaluation of this type of operations (document GN-1722, IDB/EVO, 1996). However, a general concern for the quality of receiving waters was absent during the initial years when the priority was to increase the water supply. The magnitude of the problems caused by the pollution and contamination of receiving waters prompted a surge in investments in water pollution control during recent years. This was further fueled by the emphasis on pollution prevention resulting from regional meetings at the highest political level, such as the 1994 Miami Summit. Although most of these investments are project-related, basin-wide projects (such as Guaiba) which represent a step toward integration, are beginning to emerge (although within the same subsector).
- c. Concern for Management:** An increasing concern with management in the water supply, hydroelectric energy, and irrigation subsectors initially resulted, in part, from specific recommendations in Bank evaluations of irrigation investments and small and medium-scale irrigation projects, water impoundment projects, rural potable water and water supply and sewerage projects, and hydroelectric projects (IDB/EVO, 1996). This concern was initially over specific project matters such as institutional strengthening, economic efficiency and effectiveness of tariffs, participation of farmers and beneficiaries, community promotion and participation of women in rural potable water projects, financial sustainability of projects, reducing unaccounted-for water losses in water supply projects, water metering and improvement of rates of collection, efficient use and management of irrigation water, adequate maintenance of works, reaching adequate cost and demand estimates, and conditions that warranted the justification of subsidies to low-income groups. This trend

was later reflected in an increase in the importance given to restructuring of the water supply subsector in recent investment projects, to be further supported by the recently approved Bank policy on public utilities.

- d.** This concern about management aspects in the water-use subsectors may also have had an important effect on the hydroelectric project pipeline, as the current trend is to re-structure the subsector within the broader concept of the energy sector strategies now under preparation by the Bank.

Recent privatization experiences in several countries have also fueled the need for Bank support regarding regulatory entities for both water supply and energy. In the irrigation and drainage subsector, several Bank operations have given attention to the need for water-use management of the irrigation systems to increase efficiency in their operation and maintenance. Also, there is a trend to include this type of project in broader agricultural, hybrid and time-slice loan frameworks. Recent emphasis on operations that foster the modernization of the State has led to an increase in the attention given to the institutional aspects of water-related subsectors such as energy and water supply, although in a fragmented manner. Institutional strengthening and reform have also been included in some environmental operations where water is placed under that broader umbrella.

- e. Concern for Integrated Water Resources Planning:** While Bank evaluations and resulting follow-up actions dealt extensively with management issues within specific water-use subsectors (as stated in the previous section), concern for integrated water resources management has been more limited. Nevertheless, it appears in some evaluations, including the following:

! Small and Medium-Scale Irrigation Projects: GN-1433 states that "...in the

case of projects and programs that involve multiple uses of water, these uses must be clearly studied and the rights of each user defined...”;

- ! Water Supply and Sewerage Projects: GN-1299, regarding the use of groundwater, states that the Bank must “...be certain that the borrower can control drilling by outside parties in the zone of influence of these sources...”;
- ! Hydroelectric Projects: GN-1551 calls for “...an optimization of river basin development, whenever relevant...”; and
- ! Water Impoundment Projects: GN-1724 notes that “...impoundment projects funded by the Bank should be integrated with regional river basin development, environmental pollution control, and watershed management plans and programs whenever the size and nature of the project makes integrated planning desirable...”. However, it was not until IDB-8 that specific follow-up actions in

this regard were clearly articulated.

- f. **Private Sector Investments:** The creation of the private sector loan window led to a shift in the emphasis on hydroelectric projects by other types of generation more amenable to private investment. These types of operations have also started in the 1997-1999 pipeline for water supply, although the effect that this will have in the subsector project pipeline is not yet apparent. However, a general characteristic of the operations presented so far, has been that they are project-oriented and not specifically concerned with subsectoral or sectoral water resources development and/or management.

These trends in the water-related activities of the Bank, in a sense, reflect the general situation in the region which is discussed in the next chapter. Some changes have been occurring and attempts are being made to move away from the solutions of past years.

III.

The Need for Integrated Water Resources Management

A. BENEFICIAL USES OF WATER

In this document, the term *beneficial use of water* is applied broadly to any use that provides a service to society and/or the environment by removing water from its source, using its flow, or leaving it in place, such as potable water, energy, transportation, conservation of biodiversity and wetlands, waste disposal and dilution, deposition of fertile soils in flood plains, etc. None of these uses are *a priori* “good” or “bad.” Any of these uses may be complementary to other uses or may enter into conflict with one or more uses.

B. WATER USE CONFLICTS

Water use conflicts may be in volume and/or in quality. Conflicts are increased where water is scarce and the maximization of benefits from a single use (for example irrigation or hydropower generation) are attempted without due regard for other possible uses of water from the same source, reservoir storage volume, or watershed.

As a result of increasing water use trends in the region, it has been estimated that investments in water resources infrastructure in the order of US\$100 billion will be required in the next 20 years (WWF, 1996). Many of these investments will be in new reservoirs to regulate streamflow, thus increasing water losses from evaporation. And, as a consequence of the region’s patterns of water use (discussed above), many subregional, basin, local and water use conflicts will appear or will be exacerbated mainly in the region’s highly populated water scarce areas. For example, the number of Latin American cities with more than 10 million inhabitants will increase, and it has been estimated that by the year 2025, about 85 percent of the total population of the region will be urban

(United Nations, 1995), thus increasing water withdrawals and instream use for transport of wastes.

The forecasted increase in demand for human consumption, agriculture, industry and tourism (the latter is increasing in some countries), means that surface and groundwater resources as well as coastal areas, will suffer from increased pollution. This will, in turn, increasing conflicts between the established beneficial uses and between these and new uses and the environment, endangering land, freshwater and marine biodiversity. The small island states of the Caribbean, with their high reliance on groundwater and interaction between inland and coastal resources, face a number of unique challenges in the future.

These trends will also have serious effects on the region’s freshwater ecosystems. Extensive wetlands are being transformed into rice fields, and new technologies are being applied to drain native wet grasslands for plantations with little consideration for the long-term groundwater needs of these areas. Shrimp farms have also replaced once-extensive mangroves in certain areas. Dams and channelization could also potentially undermine important wetland resources (Bucher et al, 1996).

C. WATER USE PROBLEMS

One or more water use problems may be present in the described situations. The most common are externality, open access, public interest, and scarcity problems.¹⁴

¹⁴

The definitions for these four water-use problems that follow are taken from Lord and Israel (1996).

Externality Problems: an externality, whether positive or negative (i.e. a benefit or a cost), is said to exist when the actions of one party affect the well-being of a second party, and the first party cannot itself gain by considering this effect and modifying its behavior accordingly. It is a purely asymmetric situation. There is nothing that the bearer of the externality can do directly to lessen the impact. An example of a cost (negative) externality would be an upstream paper mill which discharges wastes into a river, thereby reducing downstream fish populations upon which others depend.

Open Access Problems: an open access problem is said to exist when access to the use of the resource is open to all, and when the rate of use of that resource affects the amount that can be used. An open access problem is a symmetric one, because each user creates a cost which is spread over all users, including him/herself. However, the cost which a single user bears is minor in relation to the total cost imposed upon all, and thus no user takes into account the full implications of his/her actions. An example would be excessive pumping of an unconfined aquifer lowering the water table and eventually, reducing yields.

Public Interest Problems: a public interest problem is said to exist when a particular good must be provided to all in equal amounts. No one can be excluded from consuming it, and the cost of providing it to one person is as great as the cost of providing it to all. The problem is that these goods are likely to be undersupplied because no one will undertake to produce them, since they cannot be withheld from others, thus cannot be sold at a profit. These goods must therefore be provided by government, but it is usually impossible to determine how much should be produced because no one pays, disclosing what the good is worth to him/her. An example would be the preservation of an endangered species or of a unique ecosystem.

Scarcity Problems: a scarcity problem exists when the users desire more of a good than the quantity available at a given price. Economic markets handle scarcity by allowing competition, in which

those with the most purchasing power, and to whom the resource is most valuable, will bid it away from others. To safeguard the low-income strata of society and environmental needs, the negative real income effect of scarcity on the poor is commonly dealt with by non-market institutions such as river basin councils or the government.

Among the main problems identified in the survey of water resources management in LAC (Lord and Israel, 1996), four are at the water use level. These are: (i) contaminated surface and ground water supplies due to poorly controlled pollution (externality); (ii) shortage of potable water supplies (scarcity); (iii) saltwater intrusion and/or excessive pumping costs due to aquifer mining (open access); and (iv) excessive urban flood damages (public interest, in some cases). Although these situations may include aspects from more than one type of problem, they have been so grouped for illustrative purposes.

D. FRAGMENTED APPROACH

When population and economic development pressures were relatively low and water use conflicts both in quantity and in quality were relatively rare, most countries in LAC reacted to the above types of problems, especially the scarcity problem, by increasing investments in water resources development, as reported by ECLAC (1991). That is, by developing new sources of fresh water and increasing the supply for the corresponding beneficial uses. Emphasis was on subsectoral project-based water resources development, rather than on integrated water resources management. As used in this document, these terms have the following meaning:

Water Resources Development: projects or actions aimed at *increasing the supply* of water for one or more specific subsectors. They can be single or multi-purpose, depending on the number of beneficial uses of water for which the projects or actions are envisioned, designed, operated and/or applied.

Water Resources Management: projects and actions aimed at *increasing the conservation of water and the efficiency in its use* and increase complementarity and/or decrease conflicts between competitive uses, both in quantity and in quality *in a given subsector*, by managing both supply and demand and by enabling adequate organizations, regulatory frameworks (laws, policies, strategies, plans, programs and rules) and human resources. For example, water resources management in the water supply and sanitation subsector.

Integrated Water Resources Management: water resources management where the aim of its actions and projects also includes the allocation of water and decreasing of conflicts *between competitive water resource subsectors* and uses, both in quantity and in quality. Sometimes it is also referred to as comprehensive water resources management. For example, how much water from a given source in a given watershed and how will it be allocated to irrigation, how much to water supply and sanitation, how much to the environmental needs of ecosystems, how much should be left unallocated, etc. It is the process of diagnosing, responding to and resolving water use problems acknowledging their interrelationships. Integrated water resources management is much more than the physical provision of water services. It is both supply- and demand-oriented, and recognizes that choices must be made and trade-offs must be analyzed to achieve the best use of limited resources among competing uses, users, and generations.

Needless to say, there is no need for integrated water resources management when all present and prospective uses and users of water, including the preservation of ecosystems, can be satisfied without difficulty. That is perhaps why, traditionally, the focus of water entities has been toward water resources *development* which, as previously noted, is supply-oriented and concerned primarily with independently facilitating single purpose water uses, such as irrigation, municipal water supply, or navigation. Considerable investments have been made in the region in this respect, as can be seen

from the history of Bank financed projects presented in Chapter II.

But increasing population and per capita demands, rising costs per cubic meter of supplied water (which, according to the World Bank (1992) is estimated to double by the next generation), and pervasive poverty and low water supply and sanitation coverage (in rural and urban areas), have raised concerns about the efficiency and equity of such a narrow approach. By trying to independently maximize the specific benefits in each use, conflicts in quantity and quality were and will be created, and potential complementarities between water uses and users and between these and the environment were and will be overlooked.

Despite massive investments, estimates indicate that about 78 percent of the people now living in the region have access to safe water. Results from an UNICEF/WHO sample of 19 countries in the region with a total population of 131.3 million, show that only 69 percent of the people have access to sewerage services (Aldama and Gomez, 1996). When distinction is made between urban and rural areas, estimates indicate that in 1990, the access to water supply and sewerage in the region reached about 87 percent and 79 percent, respectively of the urban population, and 62 percent and 37 percent, respectively, of the rural population (WWF, 1996).

Even though the amount of land under cultivation has increased in the last 25 years, there are large areas of agricultural land that lack proper irrigation. Chile, Ecuador and Peru have irrigation infrastructure in more than 30 percent of their irrigable land, but in other countries such as Argentina, Brazil, Honduras or Venezuela, the coverage is less than 10 percent. As for power generation, 64 percent of which is produced from hydroelectric sources, LAC has developed less than 22 percent of its total capacity (Aldama and Gomez, 1996).

Even if water resources management has been attempted in specific water resources subsectors

(such as water supply and irrigation), in general there is no adequate administrative structure in the region to manage water resources in an integrated manner or those compromised by urban growth. In fact, most of the existing institutional systems hamper, rather than promote, an effective management relationship between large urban centers and the water users elsewhere in the basin (Davis, 1996).

E. A CHANGE OF PARADIGM

Because of similar findings in other regions, a consensus has developed among some international lending organizations that current practices are not sustainable from either economic or environmental perspectives (Serageldin, 1995). The lessons of the last decades have compelled professional associations and international organizations to recommend and attempt a decisive break from past policies and to embrace a more sustainable approach (ASCE, 1996; World Bank, 1993; UNICEF, 1995; Asian Development Bank, 1995; UNDP, 1996).

In LAC, the changes in political and economic policies which have taken hold in many countries in response to the conditions of the "lost decade" of the 1980s, have had a noticeable impact on the treatment of water resources problems. More than in other regions of the world, some important characteristics and trends have become evident (Lord and Israel, 1996). The central government's role is being redefined through a series of structural reforms, such as the expansion of market principles and the privatization of state run enterprises aimed at reducing direct government intervention in the economy. The decentralizing and liberalizing policies have given LAC water managers room to experiment and test new options, and they have become pioneers in many market-oriented, incentive-based measures. A number of incentive-based instruments are available to water managers and policymakers, including marginal cost pricing, groundwater use charges, water rights markets and effluent charges. Many have been contemplated or implemented in LAC and their adoption is likely to

increase in coming years with the continued encouragement and support of international lending institutions and the accumulation of local experience.

This is causing a shift of emphasis in the treatment of water resources problems, in accordance to generalized international and LAC consensus.¹⁵ The shift has been initially from an emphasis on water resources *development* (supply-oriented) to water resources *management* (supply- and demand-oriented), within the major water resources subsectors, mainly water supply, irrigation and hydropower generation. Increasing the emphasis on demand management, for example, would contribute to minimizing the size of treatment plants, supply farmers with nutrient-rich water (thus saving on fertilizer costs) and provide a source of revenue for the wastewater treatment plants. Additionally, it allows for more fresh water for other uses such as human consumption and for ecological conservation.

Accordingly, many water resources organizations in LAC also favor a shift from a *subsectoral* approach in which projects and demands for uses such as water supply, irrigation or hydropower generation are considered in isolation, to an *integrated* water resources approach. This does not mean that all problems are to be solved at the same time, but rather favors a "thinking globally but

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United Nations Water Conference (Mar del Plata, 1977); WMO International Conference on Water and the Environment (Dublin, 1992); United Nations Conference on Environment and Development (Rio de Janeiro, 1992); The Netherlands Ministry of Housing, Spatial Planning and Environment's Ministerial Conference on Drinking Water and Environmental Sanitation (Nordwijk, 1994); WMO/IDB Conference on Water Resources Assessment and Management Strategies in Latin America and the Caribbean (San Jose, Costa Rica, 1996); OAS Second Inter-American Dialogue on Water Management (Buenos Aires, 1996).

acting specifically” approach, in which individual projects are evaluated against a framework that takes hydro-economic-social and environmental systems into account, where demands for all beneficial uses of water from a given source, including ecological uses, are given due consideration. Integration occurs at the framework, not necessarily at the individual project level. Table 2 illustrates the point in a very simplified manner.

Another important trend related to an issue that will become increasingly important and noteworthy in the future, but one that will require additional research efforts, is the consideration of all freshwater ecosystem functions and services in

integrated water resources management. That is, all the benefits that they can provide to society in addition to water supply or flood regulation, such as protection from natural forces, micro-climate stabilization, global carbon sink, high rate of production per unit of land, habitats for threatened species, etc.

However, there are still many obstacles that hinder integrated management (Lord and Israel, 1996; IDB/San Jose Proceedings, 1996; WMO/ IDB, 1996; OAS, 1996). These are discussed in detail in the references cited and are summarized in Table 3.

Project-Oriented Water Resources Development	Subsectoral Water Resources Development	Subsectoral Water Resources Management	Integrated Water Resources Management
<p>Isolated projects for water supply, irrigation and drainage, hydroelectric generation, navigation, recreation, etc.</p> <p>Each project tries to maximize the benefits for that particular project. An implicit assumption is that a given source of water exists exclusively for that project.</p> <p>What happens with water use return flows has lesser importance.</p> <p>Emphasis is on solving individual water use problems such as scarcity or public interest by increasing the supply.</p> <p>May create serious conflicts between users and uses, but may be adequate if water is abundant and user requirements can be easily satisfied.</p> <p>May create serious environmental problems.</p>	<p>Projects for similar beneficial uses, but conceived within a subsectoral framework.</p> <p>Benefits for the subsector are maximized. An implicit assumption is that the sources of water exist solely for the purposes of that subsector, for example, irrigation, hydropower, etc.</p> <p>Projects are generally derived from subsectoral master plans, such as irrigation and drainage, energy, water supply and sanitation, tourism, etc.</p> <p>Emphasis in solving problems by supply augmentation remains, but generally regarding the needs of a particular subsector.</p> <p>May solve conflicts between users, but may still create conflicts between uses. May be a under similar conditions as in the previous case and when only a few uses are predominant.</p> <p>May still create serious environmental problems.</p>	<p>Similar approach as before, but tries to solve water use problems such as scarcity, public interest, externality or open access, through infrastructure projects and/or institutional innovation.</p> <p>These projects and/or actions evolve from subsectoral restructuring or modernization of the State programs (such as for the water supply and sanitation subsector, the energy sector, the agricultural sector, etc.), where an attempt is made to individually maximize the benefits for given subsectors or sectors. For example, the unilateral assignment of water use permits by the energy sector.</p> <p>It is a more efficient way to solve problems, especially when important conflicts exist between users or the scarcity is a consequence of the inefficiency of the providers. May still cause conflicts between uses. May still create serious environmental problems.</p>	<p>Similar approach as before, but individual projects and/or actions result from consideration of all uses, including the environment. Tries to solve conflicts between users and uses through increasing the supply but also through institutional innovation and demand management.</p> <p>It usually responds better to the adjectives of “comprehensive,” “environmentally conscientious,” “incentive oriented” and “participatory,” that the water resources activities need to have associated with in order to be sustainable.</p>

Table 3: Main Water Resource Problem Identified in LAC

Main shortcomings in water resources management identified in LAC to whose solution the Bank could contribute:

- C The delivery of water services typically is centralized in government organizations and agencies which are often overextended, underfunded, and ill-organized to provide quality services, resulting, for example, in deteriorated infrastructure and low efficiency.
- C Traditionally, regulatory approaches have been favored over marketing or other incentive-based approaches. Changes in management have occurred mostly through centralized government and without the participation of the stakeholders.
- C In many instances, legislation for management of water resources includes provisions which may no longer be relevant and may actually constrain new management initiatives. A more significant concern is the general lack of rules and regulations for monitoring and enforcing existing legislation.
- C Water resources management often is hindered by a lack of adequate and reliable hydrologic, meteorologic, and water quality data, as well as information on socioeconomic characteristics and indicators of water use efficiency and, in general, reliable indicators to be used as a basis resolving conflicts.
- C High rates of urbanization pose unique problems and challenges to water resource managers.
- C Water resources management activities are dispersed and fragmented and, more often than not, divorced from environmental management. Water resources management is often hindered by ignoring the many ecosystem functions and services.
- C Water resources management often is hindered by shortage of adequately trained human resources at all levels.

SOURCE: (Lord and Israel, 1996; IDB/San Jose Proceedings, 1996; WMO/IDB, 1996; OAS, 1996).

IV. Rationale For Bank Involvement

The period leading to the next century has been of rapid institutional change in Latin America and the Caribbean (LAC), and changes are occurring (and more can be expected) in policy, law and other institutions to increase efficiency and attain sustainability, permitting the participation of civil society in the process of making decisions about issues that are important to the affected communities. Water is one, if not *the*, most vital of these issues. Water is the natural resource on which human life, food security and the health of the ecosystems depend.

Increasingly in LAC, the growing demands and scale of developments; the need to make the best use of scarce resources among competitive uses, users and generations; the need for environmental sustainability; the recognition that water is both of economic and social value; and the fact that independent maximization of benefits for each specific use creates serious conflicts in quantity and quality, are the forces driving this shift.

The Inter-American Development Bank is committed to the sustainable development of its borrowing member countries. Since 1961, the Bank has been investing almost one billion US Dollars per year in water-related projects, and this trend is expected to increase in the near future. This effort undoubtedly has contributed to fulfilling many of the needs of the region in water supply and sanitation, energy and food production, but this has been accomplished mostly through project-oriented and/or subsectoral water resources development.

There is consensus that the fragmented approaches of the past and the attitude that water can be treated as an unlimited resource, are rapidly leading to increased conflicts, inefficient use and deterioration of this valuable resource. Investments may still be necessary but have ceased to be sufficient for resolve these problems. Lessons

learned through the execution and evaluation of the Bank's water-related operations (IDB/EVO, 1996; see Chapter II) have prompted shifts toward subsectoral water resources *management*, lately reinforced by the recently approved Bank policy on public utilities (OP-708). However, drastic changes in attitudes and behavior are still needed in order to shift to an *integrated* water resources management approach. Obviously, the economic consequences involved in resolving the many water use problems have been enormous. In fact, the largest and most costly Bank investments in water-related projects have been those designed to decontaminate and recuperate water bodies, supply water to cities from new, increasingly distant sources and protect growing urban centers from flooding. It is likely that the cost of these projects to society would have been far lower if an integrated approach to water resources management had been followed.

One of the greatest benefits of integrated water resources management is likely to be the prevention of these otherwise costly damages to society. The shift toward integrated water resources management, however, will take time and considerable effort. This is a difficult political task, given the powerful interests vested in the status quo. In the water resources sector, as in other sectors, the countries recognize the importance for these changes to be wisely conceived and effectively implemented. They know what to do, but need support to do it. There is a call in the region for the international aid and lending organizations, especially the Bank, to use their capabilities of making conditional loans and providing technical assistance to encourage and facilitate the implementation of what may otherwise be very difficult innovations in the water resources field.

As stated in the evaluation of environmental planning and management for the Bank's water

impoundment projects “...it has long been recognized that individual water projects need to be planned within the broad outlines of a plan for the entire drainage area to yield maximum benefit...” (GN-1724, in IDB/EVO, 1996). Furthermore, despite advances in following a water management approach when financing projects within the water supply and sanitation subsector, for example, one of the main problems remaining is that the use of water resources has been regarded as one of production and consumption, and not one of integrated management, which would also include its links with other water uses (hydroelectric generation and irrigation, for example), as well as consideration of the quality of the water supply and wastewater disposal (Corredor, 1996).

Therefore, a Bank strategy is needed to support a process of sustainable changes for the implementation of the well-known and recognized principles of integrated water resources management, derived from Dublin and Agenda 21; namely,

- ! to apply the most convenient methods to allocate limited natural and economic resources among competitive needs in the best possible way;
- ! to promote efficiency in water use;
- ! to choose between highly water consuming productive activities, highly polluting societal water uses in municipalities and industries, and long-term environmental conservation needs;
- ! to properly assess how much water is available for meeting expected demand and

evaluating the impact of development works and pollution on the water system in particular and the environment in general;

- ! to help bridge the gap between what is technically desirable and what is politically feasible.

Furthermore, there is presently a trend in LAC to allow participation of the private sector in the financing and provision of services that for a long time were the sole domain of the public sector. Some of these (like hydropower, water supply and sanitation, and irrigation), deal with the use of a common resource at both ends of the spectrum: the source of supply and the receiving bodies for the wastewater. Although regulatory agencies can be successfully established in each of these subsectors to deal with matters pertaining to the services themselves (like energy or water supply and sanitation) they cannot effectively perform the function of allocating water among competing subsectors since they are all interested parties. This function must be assigned to an independent water resources body which is capable of looking at water in an integrated manner.

This is consistent with the requirements of the Eighth General Increase in the Resources of the Inter-American Development Bank which calls for guidelines supporting an integrated water resources management approach. Similarly, the Summit of the Americas for Sustainable Development held in Santa Cruz, Bolivia, in December 1996, included among its approved initiatives, the implementation of integrated water resources management actions.

**PART TWO:
THE BANK'S STRATEGY**

V. Goals and Objectives

Responding to the needs described in Part One, the Bank started a process of review and analysis of water resources management problems in the region and the strategy approaches that are best suited to resolving them. This helped identify priority issues where Bank involvement could make important contributions. It also helped define the components of the IDB's strategy. The goals and objectives are part of this, along with the guiding principles, the strategic instruments and the Bank's instruments and actions.

Box 1 Strategy Components	
C	Goals and Objectives
C	Guiding Principles
C	Strategic Instruments
C	IDB Instruments and Actions

F. GOALS

The external goals of the Bank's strategy are to support a process of change regarding water resources issues; namely, a shift from development to management and from a sectoral to an integrated approach. This follows the accepted principles of the Dublin Declaration, Agenda 21, the San Jose Declaration and the Declaration and Action Plan approved by the Heads of State during the Summit of the Americas on Sustainable Development held in Santa Cruz de la Sierra, Bolivia, in December 1996.

These changes, which have already been initiated in Latin America and the Caribbean, have the following aims:

- C More efficient ways to allocate and conserve water with due consideration of social equity.
- C Better ways to resolve conflicts among competitive uses and users, including environmental ones.
- C Account for the social, economic and environmental value of water in the process of sustainable development.
- C Give due participation to the communities and the private sector.

Box 2 The Goals	
General goals are to support implementation in LAC of the principles of Dublin, Agenda 21, the San Jose Declaration, and the Bolivia Summit on Sustainable Development, regarding water resources management.	
Specifically, the goals are to support a paradigm shift which has already started in the region, from development to management and from sectoral to integrated approaches in water resources. This shift will lead to:	
C	more efficient ways to allocate and conserve water and to solve conflicts among competing uses;
C	account for the social, economic and environmental value of water; and
C	increase participation of communities and the private sector.

In addition, the Bank will be sensitive to other goals that individual countries may pose. These might include such issues as strengthening water resources management, strengthening regional trade, reaching agreements on the use of transboundary water resources, strengthening subregional links among groups of countries, or using natural advantages for subregional development.

B. OBJECTIVES

The internal general objectives for the Bank's involvement in integrated water resources management are set forth by the conditions of IDB-8, namely: poverty reduction, social equity, modernization, integration, and the environment. Subsumed in these overarching internal objectives, IDB-8 calls for assistance to the borrowing member countries to develop viable freshwater sources and systems through a variety of initiatives, such as: developing and implementing guidelines; devising and employing integrated approaches that will converge over time upon least-cost solutions for investments in water resources development; identifying and preparing projects and project components, including water conservation programs; and encouraging better use of water resources and advances in water technology.

IDB-8 specifically calls for the Bank to “develop and implement guidelines on water resources management which support an integrated approach to watershed management based on consideration of all sources and uses of water in a particular river basin” (IDB,1994).

The strategy incorporates some practices already being applied by the Bank and proposes new ones, providing a coherent set of guidelines and specific and concrete actions for operational activities, conducive to the improvement of integrated water resources management in the region. However, it is not intended to be a detailed guide on how to treat specific subsectoral projects, such as water supply, sanitation, water pollution control, irrigation and drainage, flood control, hydroelectric generation or watershed management. *Its objective is to enable the inclusion of critical aspects of integrated water*

resources management related to the country's water resources sector in general, in the water-related operations of the Bank (see Chapter VIII).

The focus of the strategy is on *principles* and on the *application of instruments*, not on the instruments themselves, such as privatization, tradable water rights, river basin councils, community participation, watershed management, or investments in civil works. How the Bank chooses to use these instruments for the objectives it has chosen to pursue, needs to be clearly identified and agreed with each country on a *case by case basis*. However, the dialogue with the countries will not be passive, in the sense that information about how these instruments operate will be given to the countries at the same time that information on local conditions is obtained.

Although some guidelines for analysis of water-related Bank projects are provided, the strategy is *flexible*, and cannot be considered a "cookbook." Different countries and regions within countries may be at significantly different levels of development and management with respect to water resources, they may have very different needs, and may have very

Box 3

The internal objectives of the strategy are to provide operational guidelines for the Bank's involvement in integrated water resources management in Latin America and the Caribbean, in support of the region's efforts toward shifting from a subsectoral to an integrated approach and from an emphasis on development to one on management. This will be done while recognizing the social, economic and environmental value of water, ensuring the participation of communities and the private sector, and giving due consideration to social equity issues. The aim of these guidelines is to support more efficient ways to allocate and conserve water and better ways to solve conflicts among competing uses, including environmental ones. To produce sustainable results, the strategy

different resources available to address water problems. The Bank will strive to work within the *existing* political, legal, economic, and sociocultural frameworks and management practices to the greatest extent possible, but will propose institutional changes in the water resources sector, when necessary.

The strategy is also *adaptive* and recognizes that different water use problems as well as conservation of fresh water ecosystems may be structurally

different, each type requiring drastically different approaches. It is a *problem-solving* strategy that recognizes the substantial contribution that the Bank can make to water resources decision-making in LAC.

In summary, as briefly described above, the strategy is meant to be a *guide for the Bank's involvement in integrated water resources management (IWRM) in Latin America and the Caribbean.*

VI. Guiding Principles

This chapter describes the principles that comprise the general philosophy of the IDB's strategy for involvement in integrated water resources management. *These principles will serve as a guide for the development and implementation of Bank assistance programs in the water resources sector.*

A. PROMOTING COMPREHENSIVE SUB-REGIONAL AND/OR NATIONAL WATER RESOURCES POLICIES AND STRATEGIES

The relationship between a country's water resources and its socioeconomic development is intricate. The diversity of hydrologic regimes, legal and administrative infrastructure, relative degrees of development, cultural characteristics, social aspirations, investment priorities, and geographical conditions precludes the development of a general water resources strategy for all subregions or even for all countries within a subregion.

There is little hope for improved water resource management in LAC countries unless the countries possess national policy and legal environments which are conducive to effective water resource management. Many countries do not possess such fundamental institutions, or if they do, these are not structured effectively. Only minor structural changes will be needed in some countries, but more substantial changes will be needed in most. Formulation of national water resources strategies should begin by evaluating the effectiveness of existing top-level organizations, current legislation and policies, and unique administrative and governmental features. The result would not be a national water plan, in the sense that a plan has come to mean a collection of proposed water resource development projects, based upon hydrologic, engineering, and economic analyses, but a series of steps aimed at removing existing bottlenecks for

effective integrated water resources management. Several international organizations (World Bank/Frederiksen et al, 1994; World Bank/Le Moigne et. al, 1994; FAO/World Bank/ UNDP, 1995) have established guidelines for developing national water resources management strategies.

A major component of the national strategies will be a focus on subregional or basin level water resources management. This requires a careful identification and assessment of available water supplies, projections of future use (including ecological use), and presentation of development options and their potential impacts (water budgets or balances). It also requires the establishment of water rights systems and the ways to assign them that are socially and politically feasible. Economic efficiency should be sought but equity and environmental considerations must not be forgotten.

The strengthening and/or rehabilitation of hydrometeorological collection networks and the building of capacity to properly quantify and forecast hydrometeorological events such as floods and droughts caused by phenomena such as hurricanes and El Niño Southern Oscillation, are of importance not only for this purpose but also for disaster prevention and mitigation as well.

A basin-level water resource management approach also require consistency of each new activity or project with the over-all basin plan or program. Whereas technical assistance is more important than financial assistance in the analysis and decision making phases of basin-level water resource management, financial assistance becomes the most important tool for international organizations to use in the implementation phase. To satisfy short-term

Box 4
The Guiding Principles

- C promoting comprehensive national water resource management policies and strategies;
- C focus on institutional innovation and capacity building;
- C attention to both short- and long- term efforts for Bank action;
- C conforming to Bank's and countries objectives and to internationally accepted principles;
- C incentives for country involvement and for internal Bank coordination; and
- C cooperation and coordination among international financial organizations.

needs, and still ensure a reasonable prospect of consistency with future comprehensive national strategies and river basin management plans, procedural consistency requirements will be based upon the conduct of a problem assessment process to assure that the proposed project would be likely to effectively solve a real problem (see section VIII.B).

Available resources, both financial and technical, cannot support the simultaneous undertaking of national water resource assessments in each country in the region, nor would every country be equally receptive to undertaking such an assessment. Undertaking just a few assessments at a time, perhaps in the wake of drought, serious water contamination, or other water use problems, offers the additional advantage of testing and modifying the program as experience grows.

B. FOCUS ON INSTITUTIONAL INNOVATION AND CAPACITY BUILDING

Priority must be given to institutional analysis and change (both within the water use subsectors and the water resources sector) over or on a par with building physical infrastructure. Not only does water resources management consist mostly of institutional design and implementation, but even the successful operation of individual projects depends fundamentally upon having appropriate institutions in place. Many of the activities involved in integrated water resources management (demand management, community participation, or the preservation of ecosystems, for example) have little to do with building projects, and a continued focus solely upon infrastructure projects will fail to identify the needed institutional changes.

A shift in approach from subsectoral to integrated and from development to management will be easier for some countries than for others. Many factors may work against change.¹⁶ Difficult or not, this shift in focus must be recognized as the first essential step for improving water resource management, improving that water institutions must be inventoried, characterized, and analyzed just as explicitly, comprehensively, and carefully as are hydrologic and economic conditions (see sections VIII.A and VIII.-B).

From a generic point of view, taking into consideration the lessons learned from the evaluation of past Bank water-related operations (IDB/EVO, 1996), and given the present majors shortcomings and trends that have been identified in LAC (Lord and Israel, 1996; IDB, 1996), the following basic principles can be enunciated: (i) the regulatory function of the water resources sector should not be

¹⁶ Lord and Israel (1996) believe that these changes are not easy for some countries to make: custom, habit, bureaucratic inertia, organizational structure, professional specialization, and political advantage all weigh in on the side of business as usual. Institutional change can even be politically unpalatable because it carries the potential to threaten existing power structures.

within any of the water use subsectors; (ii) the water resources entity should favor a two-track approach to allow for effective community and user participation; (iii) it should favor an incentive-based approach for water allocation among competitive uses, avoiding a vertical, mainly top-down discretionary approach; (iv) it should facilitate the participation of the private sector in the corresponding water use subsector; and (v) it should favor an integrated approach for water resources management, giving due consideration to ecosystem services and functions. A limited indicative model is presented in Table 4 for illustrative purposes only. It does not cover the full range of possible situations relevant in some of the water use subsectors which may not directly relate than integrated approach, but are useful to emphasize the management approach. It is strongly emphasized that real individual solutions must evolve from the analysis of specific situations, and specific solutions should be sought, and tailored to these situations through a problem-solving approach using an analytical framework such as the one presented in Chapter VIII. The Bank will strive to encourage and facilitate institutional innovation to improve integrated water resource management within the LAC countries, but not to directly control or manage that process. In responding to the needs and desires of the individual countries, the Bank will seek to instill integrated water resources management practices that are reasonable, efficient and sustainable give the conditions under which they are applied, and to encourage the kind of analyses and planning which will lead countries to adopt better institutional arrangements, to improve existing infrastructure, and to encourage integrated sustainable water resources management (see sections VIII.B and VIII.C). In this process, the Bank will refrain from pushing, forcing, or otherwise influencing countries to adopt policies and measures which they are not prepared to handle, but will assist the countries to develop that capability.

The Bank will have to exercise considerable ingenuity in identifying and using opportunities for accomplishing, or at least initiating programs to accomplish, the needed institutional changes, when

deemed appropriate, but which will also be acceptable and desirable to those whose cooperation is essential to their success. Generic strategies for institutional innovation as part of capacity building have been developed by international organizations (UNDP, 1995).

Box 5

To focus on the specific characteristics of IWRM, the Bank will consider a series of *subregional and/or country-specific national assessments*, with the participation of the stakeholders, aimed at developing integrated national water resources management strategies, improving water resources data collection programs, and/or improving water resources policies and laws. This will provide the high level framework which would enable and facilitate IWRM efforts and the consideration of freshwater ecosystem functions and services, at the river basin or other local level. The Bank will favor the initiation of subregional and/or national assessments in those areas and countries where the sense of need for institutional change is most evident.

The need for capacity building is not a one-shot affair. The process must be sustainable and thus, it needs to be systematic and continuous. Capacity building can be carried out through a number of existing specialized institutes in LAC, some of which have in fact been doing this kind of work. To be considered, each institute should have a small permanent staff dedicated to issues of water resources management, amenable to collaborating with visiting specialists on short- and long-term assignments. The institutes would serve, in part, as think tanks, conducting research and analyses of water resource management capacity building projects in their respective subregions. The dedicated staff should have the analytical skills needed to conduct state-of-the-art *ex post* evaluations of the large experience base which already exists. They could also serve as expert consultants to new programs and projects involving capacity building in water resource management.

Box 6

The Bank will assist the nations of Latin America and the Caribbean in *building or improving their IWRM capabilities* at all which action and decision-making occur. Special cases at hand are the organizations that will become responsible for water resources management as a consequence for the decentralization process (such as municipalities, user associations and groups, and river basin councils); and the entities whose role will be the merging of the macro concerns reflected in the “top-down” approach with the micro concerns inherent to the “bottom-up” approach.

Since professional water resources staffs in many countries are dominated by engineers with little training in or familiarity with other disciplines (such as institutional analysis and environmental matters), the programs offered at the institutes should have a strong interdisciplinary focus. Fellowship programs and cooperative agreements with qualified universities throughout the world could also be worked out.

C. APPLICATION OF THE STRATEGY: ATTENTION TO BOTH SHORT- AND LONG-TERM EFFORTS FOR BANK ACTION

Developing an institutional structure (in the water use subsectors as well as in the water resources sector) which will lead to improved water resources management is a long-run, indeed, never ending process of experimentation, adaptation, learning, and improvement. Public and private decision makers need time to change ways of thinking and acting that have been long established. Likewise, the water users themselves need time to adapt to changing water management measures, practices, and rules. Furthermore, enacting far-reaching changes in national or regional water policies and laws is not something that should be done in haste, without serious analysis and informed debate by representatives of all major stakeholder groups.

There is little prospect that country interest in loans for individual water resource development projects in the traditional mold, will cease just because the emphasis of the programs of international aid and lending organizations shifts away from such projects and towards water resource management. Nor should there be a hiatus in funding such projects unless and until a comprehensive national water strategy has been adopted or until river basin management plans are far enough advanced to produce project plans. There will be certain projects which are so obviously and urgently needed, community water supply or municipal wastewater treatment facilities for example, that no national strategy or river basin management plan will be required to confirm their desirability. Nevertheless, current knowledge concerning what constitutes good water resources management should play an increasing role in generating and evaluating proposals for such projects (see section VIII.C.). However, it is the strategy, not the projects themselves, that needs to be comprehensive using the river basin or watershed as the natural evaluation, planning and management unit.

Box 7

The Bank will approach capacity building by helping and promoting the financing of two types of activities: first, the creation of a knowledge base *for institutional innovation*; and second, by the *training of country water resource professionals* in the need and methods for multidisciplinary analysis. Training and education of personnel will cover all levels. Special attention will be given to training those persons who, because of decentralization, will be assuming water management responsibilities. Since women play a central role in the provision, management and safeguarding of water, especially at the community level, all capacity building programs should have a strong gender content.

Box 8

The Bank will encourage development of medium to long-term water resources programs, considering various alternatives to reach specific goals at specific time intervals (such as five, ten and fifteen years, for example), that can be implemented by phases. One of the cornerstones of such Bank programs will be to encourage and facilitate the long-term process of institutional innovation in the countries of the region, both for IWRM as well as for natural disaster prevision and mitigation. In parallel, the Bank will continue to fund short-term, or quick response, projects (as part of these programs and as a first phase of priority investments) to solve immediate and pressing water use and water conservation problems. The Bank will help recipient countries to accomplish this but will institute increasingly stringent requirements for compliance with standards of good integrated water resource management. Eventually, conformity with an integrated subregional and/or national water resource management strategy, using the river basin as the natural management unit, will be a condition of all loans for water-related projects on a case by case basis.

D. CONFORMING TO BANK'S AND COUNTRIES GOALS AND OBJECTIVES AND TO INTERNATIONALLY ACCEPTED PRINCIPLES

The goals of poverty reduction and social equity, modernization and integration, and environmental protection, adopted by the Bank in IDB-8 will be stressed as constraints upon the selection and implementation of options for improving water

economic efficiency and financial feasibility of proposed projects,

as well as lending criteria for addressing equity and poverty reduction issues. Environmental criteria have been in use since 1979. The institutional problems which are determined in the problem identification process will directly drive the search for options, and these will be to some extent unique to each country.

On the other hand and as previously noted, there is an emerging international (GWP) and LAC (San Jose and Buenos Aires Declarations) consensus about certain principles (whose origins are the Dublin principles) that should be taken into consideration in the formulation of water resources strategies. The Bank strategy deals with the application of these principles to real situations in the Latin America and Caribbean region.

E. INCENTIVES FOR COUNTRY INVOLVEMENT AND FOR INTERNAL BANK COORDINATION

1. Country Involvement

The incentives that are referred to in this section are those used to encourage countries to pursue improvements in integrated water resources management and to cooperate with the Bank and other international lending agencies in this effort.

Box 9

The Bank will continue to test water-related proposals under policies and under procedures that have already been developed and promulgated, such as (i) guidelines for poverty alleviation issues, (ii) conducting benefit-cost analyses, and (iii) protection of the environment. The Bank will also apply guidelines for proposals to conform to the integrated water resources management principles of Dublin, the Stockholm Global Water Partnership and the San Jose and Buenos Aires Declarations (see Annex I), inasmuch as they apply to the natural, environmental, economic, political and social conditions of its borrower member countries.

management and for securing Bank assistance. The Bank already uses an internal rate of return constraint, or lower bound, in the search for the

Traditional lending practices have been geared to projects that increase the water supply or water treatment projects which, at least in principle, generate marketable products. The potential for revenue from those products creates confidence on the part of borrowers that repayment is possible and justified. Thus, there is a willingness to borrow for such projects, even though the loans are not directly guaranteed by prospective returns. On the other hand, some water resource management activities, such as the conservation of fresh water ecosystems, do not generate a prospective revenue stream. In fact, they may even diminish revenue expectations. However, such measures may be theoretically justified on the basis of their expected reductions in cost, primarily

in the form of a reduced need for capital investment to support increases in the water supply. The Bank will support the development and application of analytical procedures that yield the prospective benefits and costs of non-capital projects such as demand management and conservation of ecosystems; procedures which would not only fairly display the long-term value of such measures but which could eventually become the basis for evaluating loan programs. Loans in support of improved IWRM will have to be associated with programs which are valued locally to the extent that LAC decision makers will undertake the debt burden necessary to pay for them.

Box 10

All water-related projects will be eligible for financing. However, within the realm, the Bank will assign higher priority to *meritorious and promising IWRM proposals* from borrowing member countries and/or individuals projects conceived within an IWRM framework, including programs and action plans for solving problems related to urban water supply and sanitation and conservation of freshwater ecosystems, and strengthening of hydrometeorological networks for water resources assessments and natural disaster prevision. The funds will be made available for the implementation of their action plans whenever they comply with at least a minimum set of integrated water resources management conditions. Investments not only in infrastructure, but also in activities that protect upstream and downstream water resources, water quality and aquatic ecosystems, including coastal areas when appropriate; as well as technical cooperation activities for restructuring the water resources sector and building institutional capacity, will also be eligible for financing.

Proposal for assistance loans and/or technical cooperation will be evaluated for their ability to meet such criteria as problem solving orientation, consistency with substantive and/or procedural standards deemed conducive to effective integrated water resource management, and compatibility with the goals of sustainability, alleviation of poverty, and protection of the environment. A rating scheme for the proposals could be devised, despite the subjective nature of some of these criteria. Then, incentives could be linked to the ratings level. One way of doing so would be to key the priority assigned to prospective water-related loans to the merit ranking of the project or program, with particularly deserving proposals receiving a higher priority than those which are less deserving (Lord and Israel, 1996).

Other forms of incentives could be envisioned. One would be to provide assistance grants (technical cooperations) to finance some portion of particularly innovative and promising features (conventional loans would still finance the larger share of such projects). Another would be to extend the repayment grace period for proposals which do not generate directly marketable outputs, but which could be expected to improve overall productivity in the longer term. Yet another incentive could be the extension of substantial technical assistance to proposals which require sophisticated institutional analysis capabilities for their success. Different forms of incentives could be devised to be most effective in encouraging different types of improvements in integrated water resource management.

Box 11

An important element of the strategy is to study the provision of *incentives* for the operations groups within the Bank to cooperate and coordinate their individual approaches to water resources management and to *strive for consistency* in how the various strategic IWRM instruments at their disposal are used. The Bank will also study incentives to encourage an evolution from emphasis on project lending approval to successful project implementation.

2. Internal Bank Coordination

This strategy is a Bank-wide operational strategy and thus, relies on its endorsement by the Bank's Operational Regions as well as by the Central Departments. By not proposing a unique and "must do" line of action, but rather showing a spectrum of possibilities within an agreed path leading to agreed goals (validated as much as possible by internal consultations as well as consultations with member countries and nongovernmental organizations) it seeks to coordinate, not dictate, the message of individual approaches. It also has implications for the skills and mix of the Bank's professional staff (Corredor, 1996) and those of the project teams. Since the strategy cannot provide prepackaged solutions but rather gives support to case by case problem-solving analytical approaches, more staff and/or consultant hours will be needed for the assessments involved in the water-related projects. It must also be kept in mind that the fundamental issue will be to produce a shift from an established approach to a new one. In order for this to succeed, a sense of country ownership of the proposed changes is crucial. This involves extended consultations with stakeholders at all levels, on issues much broader than the usual water infrastructure developments, and involving many more disciplines than the usual water infrastructure developments, and involving many more disciplines than the usual engineering or economics (they will be dealing with hydroeconomic-socio political and environmental systems). This justifies the allocation of additional funds to the

project teams for hiring a wider variety of consultants and the need to funding and/or participating in networks, such as the International Network of Basin Organizations (RIOCI), or the Inter-American Water Resources Network (IAWRN; see OAS, 1996) to support those countries that are not eligible for technical cooperation. In some areas of expertise, consulting services could be very expensive and fees could exceed the usual Bank rates (Corredor, 1996).

Also, since the proposed reforms are complex and will take longer time to take hold and be accepted, mechanisms will be introduced to allow for periodic review and adjustment in a trial and error approach. For this, the active participation of project teams, of Bank staff from headquarters and the IDB Country Offices and of the executors and stakeholders is crucial. It will thus require setting incentives to encourage the evolution from a project lending approval culture to a successful project implementation culture, as previously posed by the TAPOMA report (Corredor, 1996).

Water resources management affects numerous sectors and activities for which the Bank already has or is developing an implementation policy or strategy, including Public Utilities (OP-708), Sanitation (OP-745), Public Health (PO-742), Environment (OP-703), Natural Disasters (OP-704), Urban Development (OP-751) and Rural Development (OP-752); as well as with those for which the Bank has developed or is in the process of developing strategies, such as Delivery of Social Services, Resettlement, Coastal and Marine Resources, Energy, and Sustainable Agriculture.

These policies and strategies —such as the Public Utilities Policy (IDB, 1996) regarding water supply and sanitation — deals effectively with water-related issues within their specific water use subsector. One such issue whose principles are included in the policy and for which "good practices" and guidelines are to be prepared as a follow-up activity is the concession of services. However, the links with other subsectors is not within their scope. The Integrated Water Resources Management Strategy is consistent with,

and supports, the principles of the public utilities policy, and also provides those links as well as the links to the hierarchical water re-sources sector.

F.COOPERATION AND COORDINATION WITH INTERNATIONAL ORGANIZATIONS

The twin tools of technical assistance and financial incentives which are available to the Bank and other international donor agencies can be most effective if used in a cooperative and coordinated manner. The undertaking and subsequent recommendations of the proposed national assessments could form the basis of a cooperative lending program by the several international lending agencies involved. This would provide real impetus for adoption and implementation of comprehensive national strategies to improve integrated water resources management. However, if international agencies do not cooperate and coordinate their message and their efforts, it will be easy for recipient countries to continue to “cherry-pick” desired water resource development projects and to avoid undertaking the difficult job of institutional innovation at the national level. There is little hope for achieving effective integrated water resource management under these circumstances.

The establishment of firm coordinating agreements among the lending organizations can eliminate this destructive competition. Some cooperative efforts in support of large development projects have occurred in the past, such as the Mexico irrigation and drainage hybrid investment time-sliced program, where the Bank and the World Bank provided parallel loans but had the same conditionality matrix.

A substantial expansion of such cooperation and coordination is now appropriate in the area of capacity building. Some international cooperative efforts [such as the World Water Council (WWC) and the Global Water Partnership] recently launched under the sponsorship of the World Bank, UNDP and other organizations could provide adequate forums to coordinate general principles and efforts in the water resources management area. Not only would such a coordinated approach encourage efficiency in the region, but it would also remove the ability of country politicians to play one agency against another to secure politically useful but questionable projects.

Transboundary water resources can be important elements in subregional integration and development processes in some countries. Even when the direct or market economic value of some resources is marginally significant, their environmental value and the need to protect them will necessitate international cooperation and coordination. Support provided by regional and subregional entities such as the Organization of American States (OAS), ECLAC, the Latin American Parliament (PARLATINO), the Pan American Institute of Geography Pan American Institute of Geography and History (PAIGH), or the Central American Regional Water Resources Committee (CRRH), for example, can be instrumental in establishing new treaties; facilitating the continued operation of existing agreements; and forging cooperation among the public, private, and nongovernmental entities that may be involved. The Bank will seek their collaboration.

VII. Strategic Instruments for Integrated Water Resources Management

Much of the literature on water resource management advocates such instruments as cost recovery, capacity building, stakeholder participation, decentralization, private sector participation, tradable water rights and river basin councils to solve a wide range of water-use problems. Although there is consensus about the use of most of them, there is a plurality of opinions on the inclusion of instruments like water markets and privatization, or river basin councils. The strategy supports the application of all of them as tools to solve particular problems. However, it is not the purpose of the strategy to specify the use of any one of these measures, not to generically encourage or discourage their use. *These conclusions should emerge from the national assessments and evaluations of local conditions and problems.*

Cost Recovery, Capacity Building and Stakeholder Participation

There is little discussion about the soundness of searching for cost recovery mechanisms as a basis for financial sustainability, and that capacity building may be a needed pre-requisite for successful IWRM. There also appears to be a general agreement that certain instruments, such as stakeholder participation, should be part of all integrated water management strategies, and the Bank supports it in this and other sectors.

Stakeholder participation may take different modalities according to the level at which actions and decision-making occur. It is specially important at the project level, where water user's problems are to be resolved. Water resources institutions must be able to integrate these needs and concerns into a

Box 12

The Bank will actively seek to coordinate its integrated water resource management approach and activities with all of the major lending and technical cooperation agencies involved in LAC, such as the World Bank, UNDP, UNESCO, the World Meteorological Organization (WMO), and other bilateral donor country water resources organizations. It will also seek to participate actively in global IWRM organizations such as the World Water Council (WWC), the International Network of Basin Organizations (RIOB) and the Global Water Partnership (GWP), through its normal regional LAC activities.

broader picture shared at the top in a “two-track” approach. In this manner, representatives of the civil society can be empowered as decision makers, and as partners in project execution and monitoring and in integrated water resources management and conservation.

Decentralization

One of the Dublin principles¹⁶ states that decisions should be made at the lowest *appropriate* level. But it is important to keep in mind that it does not mean that decentralization must be achieved at all costs and to the *lowest possible level*. For example, recent subsectoral attempts at piecemeal decentralization, decision-making by isolated user groups or sectors, and privatization experiments in hydroelectric power generation, irrigation and water supply, have increased the fragmentation of the administrative entities that deal with subsectoral water resources,

¹⁶

See Annex I.

making it more difficult for them to manage the process and reinforcing the need for coordination for taking a more integrated approach to water resources management (Davis, 1996).

Box 13
Strategic Instruments

- C Cost recovery
- C Capacity building
 - C Institutional reform and innovation
 - C Human resources development
- C Stakeholder participation
- C Decentralization
- C Private sector participation
- C Tradable water rights
- C River basin councils

It is also important to keep in mind that those who will become responsible for providing water services at lower levels, such as municipalities, user groups or rural communities, should be capable of dealing successfully with those responsibilities. There is a strong connection with the need for *capacity building* in the decentralization process, and *the Bank will support it as a pre or co-requisite* for decentralization in the water resources sector.

**Private Sector Participation
and the Role of the Public Sector**

It is generally accepted that privatization can have considerable economic benefits. Indeed, many countries in the region have announced their intention to increase the participation of the private sector in water-related public utilities (ECLAC, 1995). However, in general terms and for the region as a whole, it is still incipient and in most countries the greater part of the infrastructure is still managed by the public sector (ECLAC, 1997).¹⁷ It is important

¹⁷ Although private investment is increasingly common in small water supply and sanitation systems,

to note that historically, many water-based services such as electricity generation, drinking water supply, and irrigation, were provided by the private sector and it was not until the 1920s that these services were given to the states or municipalities, and not until the 1940s (and in some countries even the early 1950s) that agencies of the central government undertook that responsibility (Lee, 1990). And it is only since the 1970s and early 1980s, beginning in Chile, that governments started to transfer many public companies to the commercial private sector to try to overcome problems such as poor management and lack of cost recovery (ECLAC, 1995; European Commission, 1997).

There are many reasons indeed to believe that private enterprises will be more efficient than public enterprises,¹⁸ as discussed in ECLAC (1995), and “a perception has developed that donors regard the turning-over of state-run water-related functions as a panacea for efficiency gains” (European Commission, 1997). However, the provision of water services, especially water supply and sanitation, tend to be natural monopolies (ECLAC, 1995) and countries are faced with difficult decisions, such as:

especially in Caribbean resorts and high income suburban developments, and ambitious plans are abundant, there are limited examples (largely limited to countries such as Argentina, Mexico or Trinidad & Tobago), in which management responsibilities for major water supply and sanitation systems have been transferred to private companies (ECLAC, 1996, 1997).

¹⁸ Such as reduced political interference, strengthening property rights and providing incentives to reduce costs, avoiding concentration of ownership, and providing more effective financial management.

¹⁹ There are various forms for private sector participation in the water resources sector. These are summarized in Annex II. More information can be found in ECLAC, 1995 and 1996.

Box 14
Key Elements of Tradable Water Rights Regimes

- C They are secure and can be legally traded under the guidelines established by a legal, regulatory, and institutional framework.
- C The water rights are separated from land and thus may be traded separately.
- C Ideally, the water rights should be allowed to be sold at freely negotiated prices to anyone for any purpose.
- C Sometimes countries impose restrictions such as requiring the buyer to use it for some beneficial purpose and to require that they only be sold to a public agency at an administratively set price.
- C Holders of tradable water rights are bound to follow laws and regulations such as those relating to water quality, ensuring that a certain minimum flow is maintained for environmental or recreational purposes, and that third party water rights are not damaged by the water trade.
- C Tradable water rights may be defined volumetrically, as a share of streamflow or stock of water in a reservoir, or by shift.
- C Enforcement may be carried out by the same means and institutions as conventional water rights. Water users associations play a strong role, with public authorities playing an arbitrator's role.
- C Rights are recorded in a public registry.

SOURCE: Holden and Thobani, 1995.

- | | |
|--|---|
| <ul style="list-style-type: none"> ! continue provision through a public enterprises, although capital shortages are prompting the consideration of other alternatives; | <ul style="list-style-type: none"> ! transfer services to private management and use regulatory policy and instruments as a means to influence private sector behavior. |
| <ul style="list-style-type: none"> ! encourage autonomous, self-governing voluntary cooperatives, although this has worked better for small systems in rural areas and small towns; | <p>The last alternative is favored by many countries in the region. This requires the establishment of an appropriate system of incentives to guide economic decisions in the private provision of water-related services under conditions of natural monopoly, where the regulator acts as a substitute for the market, attempting to provide similar incentives (ECLAC,</p> |
| <ul style="list-style-type: none"> ! accept that paying monopoly prices for a high quality service may be better than continuing with an inferior service; or | |

1995). Under such conditions, *the importance of an adequate regulatory framework in place cannot be overemphasized*. “There is clear evidence that, under regulation, some kind of private sector involvement is beneficial to users.” But where regulation is limited or unenforceable, it may genuinely be that transfer to the private sector is either not viable or undesirable (European Commission, 1997).²⁰

The Bank’s Public Utilities Policy (OP-708) includes important objectives and conditions that must be met for it to succeed, such as the separation of policy, regulatory and provision functions, an adequate legal and regulatory framework, an enabling subsectoral institutional structure that promotes competition, and a strong political will on the part of the government. Moreover, the privatization of water services forces a reconsideration and readjustment of the role of the state in water management. It completely changes the demands on the water management institutions and calls for a thorough reconsideration of past water management policies (ECLAC, 1995). *The mere transfer of assets and institutions from public to private management simply is not enough*.

Lately, many new opportunities for private sector involvement are appearing, besides the traditional hydropower, water supply and sanitation, and irrigation water-related services. Data gathering and processing, wastewater treatment, recycling of wastewater and agricultural return flows and new environmental technologies in general, are fields now benefiting from the innovative entrepreneurship of the private sector. This should be encouraged whenever conditions are favorable.

But as with the rest of instruments described in this section, private sector participation in the water resources sector *should not be seen as a panacea nor as an end by itself, but as a valuable instrument*

²⁰ Furthermore, “where regulation is limited or unenforceable, an uncontrolled private sector can be predatory, exploiting the vulnerability of the poor” (European Commission, 1997).

that can help reaching further objectives, such as better service and broader coverage of water supply and sanitation services, for example. Within that context, the Bank will support and encourage private sector participation in all water-related activities and services, as an important component of broader actions for the modernization of the water supply and sanitation, hydroelectric and irrigation subsectors, as well as the water resources sector as a whole.

Tradable Water Rights

The shift to IWRM represents a move toward economic efficiency, together with a need to protect the environment and to manage the political and social effects of resource allocation (Streeter, 1997). Every LAC country, according to its constitution, laws and/or tradition, has a system for assigning water to users.²¹ The criteria for the allocation or reallocation of water rights must be part of any IWRM policy or strategy.

Tradable water rights is a favorite tool of resource economists. If water markets are adequately implemented, they can provide a method of reallocating water from low-value to high-value uses, resulting in economic efficiency. However, they have a number of conditions that are necessary for successful implementation.²²

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In some countries water is linked to land ownership and in others, water is in the public domain and permits or rights for use or disposal of wastes are assigned. As long as there is or was enough water in a given watershed or region, problems were minimal. However, as demand increases and exceeds supply and more licences or concessions are given for withdrawals and disposal, than is considered sustainable, pollution, dried-out wetlands, low-flow rivers, low water tables and user conflicts arise. Then the re-allocation of resources from lower-value to higher value uses becomes an alternative (Streeter, 1997).

²² For example, the California Water Plan (California Department of Water Resources, 1994) states that (i) water rights transfers must be voluntary, result in a real transfer of resources, must not impair rights of sellers, must not harm fish and wildlife habitats; (ii) will not cause

Streeter (1997) suggests that the areas where a water rights market could most readily be developed need to meet the following criteria: (i) limited availability of “new” water; (ii) hydrological conditions that allow for changing the point of withdrawal; (iii) reasonable size of resource area with identifiable geographic boundaries; and (iv) increasing demand with large number of traders.

Identification of a water scarcity problem in a national assessment,²³ supported by feedback from previous experiences and good practice analyses, could lead to a recommendation for institutional changes to facilitate water marketing, and, thus, allow scarce water resources to flow to their economically most valuable uses. The Bank might then require that the changes in water resource management rules which would permit water marketing also contain provisions for long-term viability, for avoiding monopolistic tendencies by effective beneficial-use clauses, for avoiding environmental degradation, and for assuring maintenance of adequate potable water supplies for the poorest users; goals which unconstrained free markets might fail to achieve.

The advantages and disadvantages of this instrument were discussed in a recent seminar organized by the Bank,²⁴ where most of the participants agreed on the

degradation of ground water basins; (iii) efficient use of existing water supplies must be demonstrated by those receiving the transfer; and (iv) impacts on third parties, especially small agricultural communities must be considered.

²³Such as in an arid or semiarid region where water resources are scarce and large water uses such as irrigation are important.

²⁴Seminar on Economic Instruments for Integrated Water Resources Management: Privatization, Water Markets and Tradable Water Rights, held at Bank headquarters on December 2, 1996 (IDB/Washington DC Proceedings, 1996). A more complete discussion about the advantages and disadvantages of these and other measures, and examples of experiences in the US and some LAC countries can be found in the seminar’s Proceedings and in IDB/ San Jose Proceedings, (1996).

following major points and caveats:

- ! countries have individual characteristics and specifics, thus there are no universal “cook-book” approaches to water management, a point policy makers and advisers should bear in mind when implementing schemes for water resources management;
- ! when water is truly scarce, current systems of administration based on public administrative decision making usually result in inefficient allocations of water and alternative mechanisms for reallocation should be considered;
- ! water markets are an economic tool that, if adequately implemented, provides a method to reallocate water from low value uses to high value uses, resulting in economic efficiency gains;
- ! water market transactions must recognize third party effects and the market should function under a regulation that ensures compensation to third parties negatively affected by market transactions;
- ! water markets have an impact on public values such as environmental quality. The implementation of the market should include ways to protect environmental quality. It should also protect social and cultural values that will also be affected by the market;
- ! water user associations play a significant role in functional markets and should therefore be strengthened. Without a water user supervision, it is unlikely that the market will provide its stated benefits;
- ! transaction costs must be minimized. Otherwise, water markets will fail to transfer the commodity from low value uses to high value uses;

Box 15

In the case of water-related project in a trans-boundary river basin, the evaluation will include the effect on the water resources and the environment on the entire basin. *The legitimate interests of the countries involved will be taken into account.* The Bank will support and encourage all initiatives for IWRM in transboundary river basins agreeable to the countries involved, *especially but not exclusively, the formation of transboundary river basin organizations.* The experience, expertise and collaboration of regional organizations such as the OAS will be sought.

- ! any water market should limit individual or cartel market power. The existence of monopolies inhibits an efficient allocation of water resources.
- ! there are certain conditions necessary to implement a successful water market. Certain capabilities should exist. Among them are an adequate legal framework (water law), a minimum institutional setting that guarantees transparency and credibility, and a competent system of information that reduces transaction costs; and
- ! if the effective beneficial-use clause²⁵ is required for parties in the market, it must be clearly defined in order to avoid bureaucratic problems due to a variety of interpretations. However, its use is not incompatible with water markets.

Several other issues were not fully resolved in the discussions. Among them are that it is not clear how a water market would account for social and cultural effects; how the market would protect the

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Clause by which the buyer must use the water for an agreed beneficial use within an accorded time limit. Otherwise the water right would be lost.

environment; how monopolies and cartels could be avoided; and how to cope with externalities created by out-of-basin transfers.

River Basin Organizations

The watershed or river basin council approach (the so called “France’s Model” or other similar models), is another example of incentive-based participatory mechanism for solving conflicts and allocate water between competitive users or uses, which in some instances has been considered as an alternative to market allocation (Kelman, 1996), such as allocation by consensus. However, it is not entirely incompatible with market allocations, since the councils may decide (by consensus) to leave water allocation to the market within the irrigation subsector, for example, or between the irrigation and the water supply subsectors.

The watershed or river basin council approach is recommendable to establish integrated water resources management strategies and to plan for water resources assessments nationally and sub-regionally.

It may also be advisable to establish basin committees or councils to coordinate the actions of several overlapping national organisms and administrative jurisdictions and to promote the role and responsibility of the various interest groups in the basin, to facilitate concertation as a problem-solving mechanism. It may also be a useful mechanism for achieving greater involvement by the stakeholders and to agree on schemes to account for opportunity costs. However, it does not mean that basin committees or councils must be established across the board.

Transboundary River Basins

Many countries in Central and South America are highly dependent on transboundary waters because the origin of most of their water resources is not within their territory. At the highest level, the LAC

Box 16

Regarding the use of the strategic instruments for improving water resources management, the Bank will assist member countries to do a careful problem-solving analysis of site-specific conditions and problems, and then an analysis of all of the strategic instruments which may be regarded as available options for solving those problems. A balance between the functions and responsibilities for the public and private sectors, between centralized management programs and market-oriented strategies, and between the expansion of services (supply augmentation) and demand management will be sought. Public participation in decision-making and due regard for the environment and the economic, political and social realities of each country will be a common denominator.

countries have expressed the high priority given to the sustainable use of water resources, including through the use of existing transboundary agreements.²⁶ Situations in which rivers and lakes border multiple countries, rivers flow from one country to another, and aquifers underlie more than one country are numerous and represent potential sources of conflict.²⁷ Notwithstanding international

efforts,²⁸ there are no clear property rights and universally accepted conflict resolution rules pertaining to transboundary water resources.

However, agreements for “equitable and reasonable use” have been reached through lengthy negotiations. The ministries of Foreign Affairs of some countries, like the United States, Mexico, Guatemala and El Salvador, have established bilateral boundary and water commissions with their neighbors. Others in South America, have created bilateral or trilateral river basin commissions.²⁹ In the subregional domain, this approach may be useful in solving problems related to water resources management of transboundary river basins, as a vehicle to promote subregionally coherent water policies and legislation, which may become increasingly needed given present

²⁶ Summit on sustainable development, Santa Cruz de la Sierra, Bolivia, December 1996; meeting of Ministers of Environment, Peru, March, 1998.

²⁷ Frederick (1996) identifies two opposite theoretical doctrines: (i) *unlimited territorial sovereignty*, which would give a country exclusive rights to the use of waters within its territory, and (ii) *unlimited territorial integrity*, in which one country cannot alter the quantity and quality of water available to another. Needless to say, in practice, upstream countries would tend to favor the first while downstream countries would favor the second.

²⁸ The International Law Association’s Helsinki Rules dating from the mid-sixties was a serious attempt. The United Nations Convention on the Law of the Non-navigational Uses of International Watercourses was approved in May 1997 by the General Assembly with 103 votes in favor, 3 against and 27 abstentions. To date, only seven countries have ratified it. However, both of these provide general principles and rules that could guide States in negotiating future agreements on specific watercourses.

²⁹ The watershed approach is also now under consideration by the U.S.-Canada International Joint Commission (American Geophysical Union, 1998). These mechanisms fall within what Samson and Charrier (1997) categorize as the “prevention” side of conflict resolution, before diplomatic action, which would be the mildest form of a “resolution” effort, before open dispute arises. However, these actions are not linear and a dispute may give origin to these institutional mechanisms to prevent further conflict.

globalization and integration efforts and trends.³⁰

Application to Given Situations

While it is true that most of these strategic instruments have been widely promoted, although yet underutilized in LAC, it is also true that none is a panacea. Each is feasible in some situations and not feasible in others. Each is a promising solution to some problems, and is likely to be ineffective in solving others. And, each is really a generalization within which considerable variation may occur.³¹

Too often, a discussion of how and in what contexts to adopt and implement these strategic instruments (and in what specific forms) is absent from the literature. The potential success or benefits of these measures should be evaluated relative to existing conditions in LAC countries and the possible long-term impact they could have on integrated water resources management, not only on the conclusions of theoretical models. A more complete discussion

Box 17 Key Elements of France's Model System

Well defined laws and regulations.

Hydrographic basin management covers four major catchment areas and two areas of dense population and intense industrial activity.

Comprehensive management, decentralization and participation: each of the six basins has a basin committee, a corresponding executing agency and a water board. The basin committees reflect regional rather than central government control and promote the role and responsibility of the different stakeholders within the basin.

Cost recovery and incentives: a portion of the charges collected by companies and entities operating water services are delivered to the basin agencies. Pollution fees are levied.

Supporting research: about 14% of expenditures go to research.

SOURCE: Serageldin, 1995.

³⁰ Frederick (1996) proposes the introduction of markets to promote a more efficient way to allocate water resources located in transboundary basins, but notes that the obstacles for this are at present formidable, and recognizes that achieving a sense of equity among the countries involved may be a more realistic short-term goal than economic efficiency in settling international disputes.

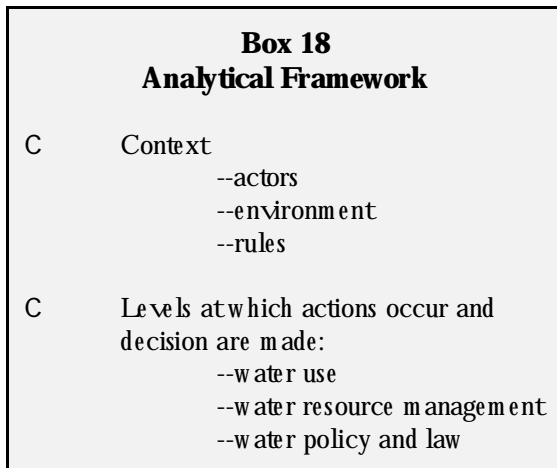
³¹ For example, the market approach has been used in Chile and Mexico and is being considered by other countries such as Peru and Ecuador. The river basin council approach has been used in Mexico and Colombia and is being considered in Costa Rica and other Central American countries, as well as in some Brazilian states.

of the advantages and disadvantages of these and other measures, and examples of experiences in the US and some LAC countries can be found in IDB-/San Jose Proceedings, (1996); and IDB/Washington, D.C.

The solution process should assess how local political, institutional, technical, economic and financial conditions match the requirements for successful implementation of the instrument under consideration.

VIII. IDB Instruments and Actions

The aim of this chapter is not to present a detailed guide on how to treat specific subsectoral projects, such as water supply, sanitation, water pollution control, irrigation and drainage, flood control, hydroelectric generation or watershed management. Its aim is to provide operational guidelines on how to use the *instruments already at the Bank's disposal* to pursue the integrated water resources management objective. This will enable the gradual inclusion of critical aspects of integrated water resources management related to the general water resources sector of the countries themselves, in the water-related operations of the Bank (starting with those countries that have expressed a willingness to do so). In this manner, the impact of changes as well as any additional resources that might be needed both within the Bank and in the countries themselves, will be minimized.



A. ANALYTICAL FRAMEWORK

The application of the strategy requires the assessment of two situations. The first is the *context* in which policy is pursued and programs developed. It is composed of *actors*, whose actions are shaped by the *environment*, whether natural or man-made, and by *rules*. The rules define the relationship

between actors and the environment and describe, for example, how costs and benefits are allocated among actors, how authority is distributed, who makes decisions and how, or who has access to what information. The second is the *level at which actions occur and decisions are made* and, by extension, where *integration* occurs. For this purpose, three levels are considered (see Figure 2): the operational or *water use level*, the organizational or *water resource management level*, and the constitutional or *water policy and law level* (Lord and Israel, 1996).

Actions at the operational or *water use* level affect the environment and are aimed at social well-being and the preservation of ecosystems. These actions include most of the water supply and sanitation, irrigation and drainage, hydroelectric and other Bank-financed projects. The fundamental problems to be solved by improved water resources management also occur at this level. In a simplified manner, these problems can be classified as scarcity, externality, open access, or public interest (see section III.C). Examples of these types of problems are, respectively: farmers and the hydroelectric entity competing for the same streamflow volumes, a municipality discharging raw sewage into a stream, excess ground water pumping which drives down the water table, and the preservation of a wetlands ecosystem. Solving them is what water resources management basically is, and requires changes in water use rules, which must occur at the *water resource management level*. At this level, plans and programs for utilizing water are designed, adopted, and implemented. It may be impossible in some LAC countries, given the water resource management rules now in place, to adopt and implement the operational rules which could effectively address the scarcity, externality, open access, and public interest problems (Lord and Israel, 1996).

Box 19

The *analytical framework* uses a structured problem-solving approach that aims to improve the identification of problems and to avoid the implementation of inappropriate measures. At any moment during the project cycle (identification, orientation, analysis, negotiation and implementation) of any water-related Bank project, an assessment will be made by the project team, based on the analytical framework, to identify the integrated water resources management problems and implement appropriate corrective measures, if needed. These will be incorporated within the proposed project(s), if possible, or recommended for future Bank action. To facilitate this task, national water resources assessments, based on this analytical framework, followed by national integrated water resources management strategies will be encouraged, and the Bank will collaborate to this end with interested countries and other international lending organizations. When appropriate, these assessments will also include water balances by watersheds or river basins and the subregional and/or national strategies will include data collection programs.

Box 20

At the water use level, the Bank will promote realistic (from the social and political points of view) commitments at the highest possible political level, for the restructuring of the water resources sector, so that representatives of civil society (communities, river basin councils, local non-governmental organizations, citizen groups, local judiciary systems) are empowered as decision makers, and as partners in project execution and monitoring and in integrated water resources management and conservation. The analyst (project teams or consultants) will identify what is already being done in the country to that end, how the Bank can effectively contribute to this by the project at hand or by any parallel or complementary operations, and the actions and resources needed for that purpose.

Creating an effective set of water resource management rules requires action at the *water policy and law level*. These higher level actions are important because a resulting ineffective set of water resource management rules virtually assures that basic water use problems cannot be solved. Changing water policies and laws requires country-wide action at the highest political level. Changing water resource management and water use rules, on the other hand, is often best accomplished at the individual basin

level, where greater specificity is possible and where stakeholder involvement is more easily gained. Attempts to improve water resource management at the basin level, however, may be frustrated by inappropriate water laws and policies at the national level. These constraints need to be identified and addressed before scarce resources are allocated to making water resources management and water use changes at the basin level.

For instance, when LAC water managers cite inadequate enforcement of legislation, they may mean enforcement of legislation, of taxes and tariffs, or of property rights. Somewhat different enforcement activities may be involved in each case. When they cite inadequate data, they may similarly refer to an array of problems requiring monitoring. When they mention inadequate consideration of environmental impacts they may refer to weak or nonexistent environmental protection regulations, to ineffective incentives to control pollution, or to lack of property rights to a clean environment. Each of these problems may have a different root cause and may require a different form of solution. The analytical framework helps finding alternatives for these solutions.

G. ASSESSMENT

To identify the integrated water resources management problems and propose the appropriate corrective measures, the following aspects will be

Box 21

At the water resources management level, the Bank will promote realistic (from the social and political points of view) commitments at the highest possible political level, for the restructuring of the water resources sector so that the coordination of the integrated water resources management approach (including the merging of the “top-down” and “bottom-up” approaches), is made through a regulatory entity outside of the water use subsectors. The analysts (project teams or consultants) will identify what is already being done in the country to that end, how can the Bank effectively contribute to this by the project(s) at hand or by any parallel or complementary operations, and the actions and resources needed for that purpose.

evaluated for each level when applying the analytical framework:

2. At the Water Use Level:

C *Problem Identification and Classification*: What is the nature of the problem to be solved by the proposed project (social well-being, conservation of freshwater ecosystems, or both)? What is the type of water use problem the proposed project intends to solve (scarcity, externality, open access, public interest, or combination of them)?

their role in project execution? What is the nature of their participation (water specific or multidisciplinary)?

C *Environment*: What are the principal characteristics (natural and man-made) of the water-use environment that shape or will shape the future actions of the actors? (See also Tables 2 and 3 in section III.E, and Table 4 in section VI.B) (Lord and Israel, 1996).

Box 22

At the *water policy and law level*, the Bank will promote realistic (from the social and political points of view) commitments at the highest possible political level, for necessary changes to be made (policies and/or laws) so that policy and legal instruments that *facilitate an integrated water resources management approach* are in place and/or constraints are eliminated. The analyst (project teams or consultants) will identify what is already being done in the country to that end, how can the Bank effectively contribute to this by the project at hand or by any parallel or complementary operations, and the actions and resources needed for that purpose.

Does the proposed project affect any important freshwater ecosystems? What are the main functions and services of these ecosystems?

Actors: Who are the actors (public sector, civil society, private entrepreneurs)? What is their role in decision-making regarding the identification and prioritization of the problem and the proposed solution(s), including the proposed project? What is

3. At the Water Resources Management Level:

C *Rules and Their Effectiveness* : Which are the rules now in place (strategies, plans, programs, regulations) for utilizing water in the proposed manner? For solving water use and conservation conflicts? For water allocation between uses, users and generations? For water resources development,

Box 23
Bank Instruments

- C Country dialogue
- C Country and regional technical cooperations
- C Trust funds
- C Sector and hybrid loans
- C Project specific loans
- C Small project loans
- C Private sector loans
- C Cofinancing
- C Bank Committees

conservation and/or management? For water (surface and/or ground water) quality control? How effectively do these rules address the scarcity, externality, open access, public interests and other water use and conservation problems, and solve water allocation conflicts?

- C *Approach:* Is the approach for using the water project-based, subsectoral or integrated? Does it prioritize development or management, or both? Is it isolated or watershed (river basin) oriented? Does it consider upstream and downstream water uses and effects, including the coastal areas when appropriate? Are there any ground water resources and water quality issues and are they duly considered?
- C *Actors:* Who are the actors (public sector, private sector, civil society) involved in the application of these rules and approaches? What role is played by each actor (specially regarding to water allocation, water resources development and/or management, and water quality control) and what is its level of empowerment?
- C *Coordinating Mechanism and its Effectiveness:* What is the mechanism (entity) in place to coordinate the implementation of these rules, approaches and decisions? Does it adequately merge the micro concerns at the operational level, with the macro concerns at the

constitutional level, thus effectively linking the “top-down” and “bottom-up” approaches for the conceptualization, design, adoption and implementation of water resources projects, within an integrated water resources management approach? What is its relationship with the national (provincial, state) environmental entity(ies)? How effective is the mechanism (entity) for the implementation of these rules, approaches and decisions made by each one of the actors? How effective is it expected to be regarding the proposed project(s)? (See also Tables 2 and 3 in section III.E, and Table 4 in section VI.B)

4. At the Water Policy and Law Level:

C Are there, at the highest political level, adequate country-wide policy and legal instruments that facilitate an integrated water resources management approach? Are there important constraints that prevent it? How could constraints be eased? (See also Tables 2 and 3 in section III.E, and Table 4 in section VI.B).

C. BANK INSTRUMENTS FOR IMPLEMENTING THE STRATEGY

The Bank has several instruments at its disposal which can be used to assist borrowing member countries achieve improvements in integrated water resources management.

1. Country Dialogue

The country dialogue is a useful instrument, at the constitutional level, to create awareness for the necessary changes that need to be made, in order to promote comprehensive national water resources management policies and strategies. It is also a useful means for disseminating the objectives and goals of the strategy. The interlocutors can be Heads of State, Congresspersons, Governors, and Ministers, but could also include politicians and important lobbying groups. It will be used by the Bank Programming Missions, Country Divisions, Field Offices and/or Identification and Orientation

Missions. The output will be real commitments to make the necessary changes. The commitments will be used to define the Bank strategy with the country. This country strategy will be expressed in the Country Paper, but could also take the form of Issue Papers or other relevant documents. Their expected results are long term.

2. Country and Regional Technical Cooperations and Trust Funds

They will be used at both the constitutional (water policy and law) and at the organizational (water resources management) levels. Their aim could be long to medium term, but also medium to short term. The interlocutors can be at the highest political level but, most frequently, will be at the level of Deputy Ministers, Directors, Middle Managers, water resources sector regulatory and coordinating entities, private organizations, river basin councils, user and community groups. Expected results will be country and regional fact-finding assessments, national water resources policies, strategies, action plans, and capacity building in general. They will also be used to identify and/or prepare a portfolio of meritorious integrated water resources management operations. They will be used both independently or in parallel with other Bank-financed operations.

3. Sector and Hybrid Loans

These are important instruments to be used at the organizational (water resources management) level, to implement the required changes and to focus on institutional innovation and capacity building, due to their conditionality matrix. Their aim is long term, but hybrid loans can also have a short-term objective financing specific and urgent measures and/ or projects. One particular modality that, when combined with hybrid loans is very useful to implement the guiding principles of the strategy, is the time-slice. This is very effective when combined with the use of technical cooperations and/or trust funds. The latter can be used to prepare a long-term strategy and action plan, with specific goals and priorities for the short and medium term. The former can then be used to finance the implementation of the

action plan by stages. It should be noted, however, that sector loans have gone to specific sectors such as energy, agriculture, municipal development, etc. The challenge would be to find the appropriate executor and the means to integrate the various sectors so that they can comply with loan conditionalities. This is also a concern in time-slice operations.

4. Project Specific Loans, Private Sector Loans and Small Project Loans

Their aim is mostly short term, to solve specific environmental or water use problems. The interlocutors are mainly at the operational or water use level, generally municipalities, communities, water users associations, NGOs, individual users, private entrepreneurs, and regulatory agencies. In the past (and in some cases this situation persists) the interlocutors were mainly centralized government executing agencies, such as the energy institutes, ministries of agriculture or water supply and sanitation organizations. These operations now comprise the bulk of Bank financing in water-related operations. For the most part, respond to a fragmented approach. Eventually, they should conform to integrated national water resources management strategies, using the river basin as the natural management unit, although their emphasis will remain on the operational or water use level.

5. Cofinancing

Cofinancing will be sought in all instances, but especially in those that will promote and/or strengthen the cooperation and coordination between the Bank and the major international lending and technical organizations, active in the water resources field in LAC.

6. Bank Committees

Within their mandate, the different Bank committees will assist the Operational Departments in the implementation of the strategy. For example, they can assist the Operational Departments to:

- ! Review the assessment of all water related Bank operations following the analytical framework included in this strategy, so that the problems and constraints for integrated management of water resources (and alternatives for their solution) are properly identified; and
- ! Recommend Bank instruments to be used for solving these problems and easing the constraints.

D. PROSPECTIVE ACTION PLAN FOR IMPLEMENTATION OF THE STRATEGY

1. Bank Actions

Regarding the internal objective of providing operational guidelines to enable the inclusion of critical aspects of IWRM in the water-related operations of the Bank, a time frame of short-, medium- and long-term actions has been planned. Since the strategy is seen as a continuum of actions, as stated in the *Introduction*, some of these actions have been completed, others are in process and yet others are in a planning stage.

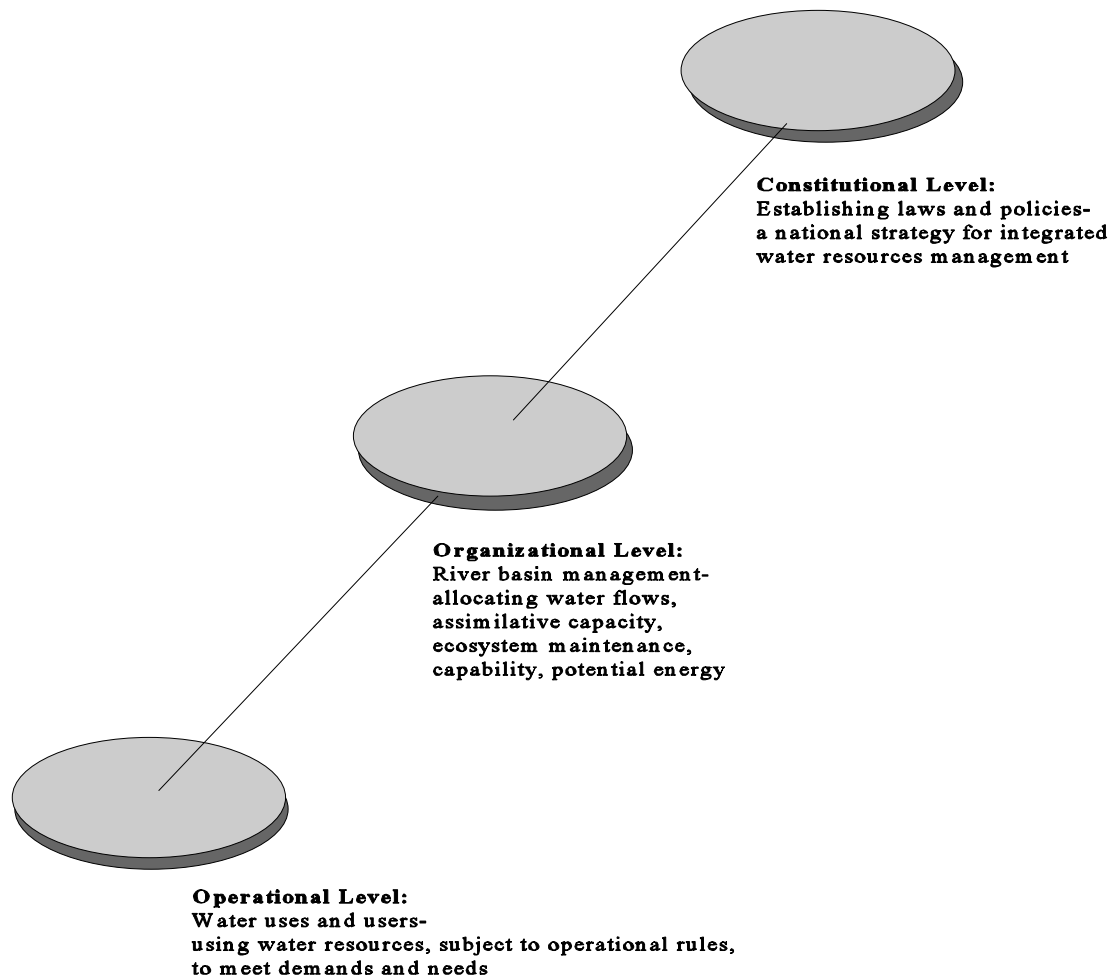
a. *Short-Term (1996-1998):*

- ! During 1996, following the presentation of the strategy profile to the Policy Committee of the Board, the activities were focused on an extensive and intensive internal and external consultation process, which provided the necessary background material to draft the strategy.
- ! Following that, 1997 was a year in which the proposed strategy itself was amply diffused and

consulted with IDB country office specialists and LAC water resources specialists, and in which some of its principles were initially brought into practice in actual projects and activities of the operational regions. For example: support for subregional and national water resources strategies and policies in Central America, Haiti and Paraguay, through technical cooperations and Trust Fund financing; initiation of institutional innovation and capacity building on the medium-term in parallel to short-term financing of water-related projects in El Salvador and Costa Rica; and coordination with international organizations active in the region such as the UNDP, ECLAC, the World Bank and the Global Water Partnership.

- ! Three priority practical guidelines and good practice material for orientation of project teams were also commissioned through Trust Fund Financing and administrative financing. These pertain to the application of the analytical framework proposed in the strategy to incorporate IWRM institutional building in water-related projects, minimum legal framework needed for IWRM in LAC, and the integration of freshwater ecosystem's functions and services in IWRM and water-related projects.
- ! Feasibility studies are also in progress or are soon to be initiated for capacity building and strengthening of the hydrometeorological networks and activities in LAC to improve short- and medium-term weather forecasts and disaster prevention related to phenomena such as El Niño, and to rehabilitate the water quality and hydrologic alert network in the La Plata

Figure 2
Levels of Action for the Bank



! river basin. It is expected that these will result in investment projects in the medium term.³²

b. *Medium-Term (1998-2000):*

! It is expected that during this period, the assessments at the water use level, water resources management level and water policy and law level

have been completed, in a cooperative effort with UNDP, the World Bank, ECLAC and other regional and subregional organizations.

! During this period, dissemination of information and discussions about the operational application of the approved strategy are programmed to begin with the Operational Regions and Country Offices. It is expected that during the same period, the general principles of IWRM will start to be mentioned and discussed during programming missions when water-related projects are

³² One, for Brazil, has already been submitted to the Bank, and similar interest has already been expressed in other countries.

considered, and that they will be included in the country strategies and papers. It is also expected that the analytical framework begins to be applied operationally for water-related projects, and that it has been mainstreamed by the end of the period, along with the consideration of freshwater ecosystems in water-related projects.

! During this period, it is expected that at least one water-related project that includes sound IWRM principles will be approved and initiated at a national or state level in each operational region. The purpose is the achievement of one or more of the following:

- (1) An IWRM regulatory entity which:
 - (a) is located outside and above any specific water use subsector, preferably linked to the national environmental entity;
 - (b) favors stakeholder empowerment and participation in a “two-track” approach;
 - (c) encourages and allows for private sector participation.
- (2) Service providing or subsectoral regulatory entities and frameworks, independent from the providers of the services.
- (3) Market - or other incentive - oriented mechanisms to allocate water in scarcity situations.
- (4) Provisions to ensure water supplies to the poorest users.
- (5) Watershed or river basin ecosystem approach to solving water use problems.
- (6) Comprehensive and balanced water resources laws and regulations and appropriate mechanisms for their application and enforcement.

c. *Long-Term (2000 and beyond):*

To be determined according to medium-term results.

2. Initial Support

a. *Administrative Actions*

Several actions to initially support the implementation of the guiding principles of the strategy have been requested by borrowing member countries and programmed by the Sustainable Development Department and the Regional Operations Departments and other Bank units.

! *Dissemination and outreach activities*, to explain and disseminate the objectives and goals of the strategy. These will be executed at Bank headquarters, Country Offices, selected international and technical organizations, and national organizations in selected countries. For 1997, sub-regional workshops and/or seminars were held in Costa Rica in May, Trinidad and Tobago in June and Brazil in November. These events were held in collaboration with other international and financing organizations active in water resources management in LAC.

! *Commission of studies* for an overall assessment of the minimum legal framework needed for integrated water resources management in LAC. Selected countries were chosen. The studies were executed by ECLAC in 1997. A good practice paper was produced in 1998.

! *Instruments for water quality improvement-economic and financial issues*: study to identify the net-benefit maximizing configuration of investments at the basin level, to improve water quality and prioritize urban environmental quality investments given budgetary constraints. The study was started in 1997; and will be finished in 1999.

- ! *Integration of specific freshwater ecosystem conservation activities*, as part of the water resources management projects. A preliminary assessment and a conceptual framework study were commissioned with NGOs during 1996 and 1997, and published in 1998. Specific activities will be considered for execution with administrative funds programmed for 1999. Guidelines for water resources functionaries and project team leaders/task managers are to be produced.
- ! *Assessment of the Institutional Framework for Integrated Water Resources Management*, to support appropriate measures for integrated water resources management institutional building in IDB water-related operations. A guideline paper to assist project team leaders in the application of the analytical framework of the strategy was produced in 1998. Financed by the Netherlands Environment Trust Fund and participation of IHE-Delft and local experts in its execution.
- b. *Technical Cooperations and Trust Funds*
- Several regional cooperations and trust fund operations have already been initiated, and others are programmed for 1998. Some of these may eventually produce investment projects. Additional national technical cooperations of a similar nature may be later requested by borrowing member countries and programmed by the Regional Operations Departments. The ones initiated and/or programmed jointly by SDS, INT, REx/ ENx; RE1/FSS and RE1/TEC, are the following:
- ! *Regional Meeting on Water Resources Institutions*: held in Brazil in November 1997 in collaboration with the GWP Technical Advisory Group. Used as a vehicle to explain and disseminate the goals and objectives of the GWP principles and those aimed by the Bank's strategy. It is expected that an Action Plan for South America will be produced.
- ! *Human Resources Capacity Building for Integrated Water Resources Management*: Its aim is to strengthen water resources institutions in LAC and establish a knowledge base for institutional innovation by training water resources professionals and instructors, managerial staff, and community leaders in the needs and methods for institutional innovation. Emphasis will be on women leaders. It would be carried out in selected LAC centers supplemented by visiting specialists from abroad. Participation and/or cofinancing will be sought from one or more donor countries.
- ! *Support for Water Resources Management Strategies and Policies*: Regional technical cooperation initiated in 1998, to assist interested and committed countries in Central America in the preparation of water resources management strategies, with common sub-regional elements. Participation of up to three countries is expected. It will be preceded in each case by a multi-faceted assessment of the water resources sector. A subregional water resources action plan is expected.
- ! *The Ibero-American Climate Project* involves capacity building for the hydrometeorological organizations of 13 Latin American countries. A regional technical cooperation for the feasibility studies is already under execution with the participation of the World Meteorological Organization and cofinancing from the U.S. Evergreen Fund, CIDA of Canada, and Spain. This project was executed during 1997 and 1998. It has already resulted in a request for an investment project and will probably result in additional investment projects from 1999 on.
- ! *Evaluation of Atmospheric UV Radiation and Ozone in LAC*. This project, which started in 1998, is financed by the Finnish Trust Fund with the participation of the Finnish Meteorological Institute and WMO. It will cover 16 countries. In parallel with the *Clima Iberoamericano* study.

- ! *Socioeconomic effects* of El Niño, involves capacity building for disaster preparedness and hydrometeorological services of countries of the Caribbean basin as well as South American countries affected by El Niño. A feasibility study financed by the Japan Trust Fund is programmed with participation of WMO and NOAA. Investment projects are expected as a result.
- ! *Water Quality and Environmental Network in the Rio de la Plata Basin.* A regional technical cooperation is under execution for the dimensioning of an investment project, involving governmental and nongovernmental organizations. It may result in a feasibility study and eventual investment projects.
- ! *Water Resources Management Study in Paraguay:* France Trust fund technical cooperation for assessment and development of a water resources management plan in Paraguay. To be executed by RE1/EN1 and CPR .

c. *Use of Selected Operations in the Pipeline*

The operations presently in the Bank's pipeline include water-related projects as well as operations whose aim is the modernization of the state and others that are related to civil society related issues.

Selected sectoral and subsectoral operations in the pipeline, like those promoting the restructuring of water use subsectors (such as water supply and sanitation) or other sectors that relate to the water resources sector (such as energy, agriculture and the environment) will initially be used as seeds to initiate the process of change.

For example, the Water Supply and Sewerage Program for El Salvador (ES-0068) includes, in addition to investments for the rehabilitation of infrastructure, important institutional innovation measures for restructuring the water supply and sanitation subsector, within long-term guidelines to be provided by an action plan for restructuring the country's water resources sector.

A somewhat similar approach is being followed in Haiti, prompted by the need to articulate the water-related activities involved in the Potable Water (HA-0014), Agricultural Intensification (HA-0016) and the electricity component of the Investment Sector Loan (HA-0046) projects in the Bank's portfolio, through a technical cooperation (ATN/SF-5485-HA) to prepare an intersectoral water resource policy.

Another example is the Rio Tarcoles Watershed Management Program (CR-0081) in Costa Rica. Recently approved legislation creates a national public services regulatory entity and transfers to the Ministry of Environment and Energy (MINAE), the responsibility for water resources management country wide. MINAE intends to follow an integrated approach by watershed through river basin commissions, the first one being the Rio Tarcoles Watershed Management Commission. The Bank project will support these efforts.

Other project-specific operations will also be selected for the same purpose by RE1 and RE3, one each, to initiate the process. These may be combined with parallel or complementary technical cooperations and trust fund financing. Similarly, selected operations dealing with strengthening the participation of civil society in decision-making and those related to the modernization of the state, could also be used initially for that purpose. The recommendation as to which operation is to be selected will be made by the corresponding Operational Region of the Bank.

IX. Summary

To promote and initiate the required changes to facilitate the integrated management of water resources in LAC, Bank action will be geared at the

Box 24 Bank Action

Bank action in the *long- and medium-term* will be targeted at the organizational (water management) and constitutional (water policy and law) levels, primarily through country dialogues, technical cooperations and sectoral and hybrid loans. In the *medium and near-term*, Bank action will be targeted at the organizational and local (water use) levels by specific projects, technical cooperations and loans to the private sector. All levels could be targeted simultaneously, if appropriate.

Operations already in the pipeline will be used initially, but specific water resources sector operations will be considered at a later stage.

It is anticipated that *initially, the main thrust of the new Bank activity regarding integrated water resources management will be geared at the organizational level*, while maintaining the necessary linkages to the constitutional level and taking account of needs and problems at the local level.

constitutional (water policy and law) level where policies and laws are formed; at the *organizational (water resources management)* level where rules are formed for the integrated management of water resources; and at the *local (water use)* level, where the needs of the various stakeholders are met.

For results in the *long- and medium-term*, Bank action will be targeted at the organizational (water management) and constitutional levels primarily through country dialogues, technical cooperations

and funds, and sectoral and hybrid loans, initially by using sectoral and subsectoral operations already in the pipeline. Of special interest for this purpose would be those operations which involve modernization of the state, restructuring of the water supply and sanitation subsector, environmental and coastal management operations, and energy and agricultural sector loans; especially those that include the participation of other international lending organizations. The Bank may consider new operations at a later stage, including specific water resource sectoral and hybrid loans.

Bank action for results in the *near-term* will be targeted at the organizational and local (water use) levels through lending for specific projects, technical cooperations and funds, and loans to the private sector, initially through water-related projects already in the pipeline. Of special interest for this purpose will also be those operations dealing with strengthening the participation of civil society in the decision-making process. As in the previous case, new operations may be considered in the near future.

Capacity building through national water resources assessments, policy and strategy formulation and implementation, training and institutional restructuring will be encouraged through specific technical cooperations or trust fund financing, in parallel to loans or by themselves, both on a national as well as on a subregional and regional scope, and preferably in coordination and/or with the participation of other international lending and technical organizations.

Table 5 summarizes, in a simplified manner, the relationships between the guiding principles of the strategy, the strategic instruments, the levels of action for the Bank, the interlocutors (main actors in the decision-making process), the principal types of problems to be addressed at each level, the main

items to be assessed in the analysis of country situation and/or Bank water related operations, the preferred IDB instruments to be used in each case,

and the main supporting actions to initiate the implementation of the strategy.

TABLE 4: EXAMPLES OF INSTITUTIONAL SITUATIONS

Context	Examples of situations to encourage (important exceptions may occur)	Examples of situations to discourage (important exceptions may occur)
<p>A. WATER RESOURCES SECTOR</p>	<ol style="list-style-type: none"> 1. <i>Integrated</i> water resources management approach for efficient use and <i>conservation</i> of the resource 2. Stakeholder <i>empowerment</i> and participation 3. Entity to <i>coordinate</i> “top-down” and “bottom-up” approaches 4. Market - or other <i>incentive-oriented</i> mechanisms to allocate the resource (examples are tradable water rights regimes and/or river basin councils) 5. Entity to coordinate and facilitate the process of water allocation placed <i>independent of</i> any specific water-use subsector, such as water supply, irrigation, hydropower 6. Provisions to ensure adequate water supplies to <i>the poorest users</i> 7. Comprehensive and balanced water resources <i>sectoral</i> laws and regulations 8. Water resources entity with close links to the national <i>environmental</i> entity for explicit consideration of <i>freshwater ecosystems services and functions</i> 9. <i>Multipurpose</i> projects 10. <i>Watershed</i> or <i>river basin</i> approach 11. Consideration of effects on <i>coastal areas</i> 12. Active <i>input and participation of women</i> regarding the provision, management and safeguarding of water 13. Provisions for strengthening of hydrometeorological networks and capacity building for IWRM water balances and <i>natural disaster prevision</i> 	<ol style="list-style-type: none"> 1. <i>Fragmented</i> approach 2. Emphasis <i>only</i> on investments 3. Centralized, “<i>top-down</i>” decision making 4. <i>Centralized</i> government entity that allocates the use of the resource <i>and</i> produces investment plans, programs, and projects 5. <i>No relation</i> to other natural resources and/or the environment 6. Proposed water resources sector restructuring solutions <i>independent</i> from modernization of the state plans and/or efforts, when they exist 7. <i>Absence</i> of provisions to ensure adequate water supplies to the poorest users 8. Attempts to regulate the water resources sector through <i>subsectoral</i> water laws (i.e., water laws originating and biased to the water supply, irrigation, hydropower, or other subsectors) 9. Water resources entity located <i>within</i> a given water-use subsector (i.e., water supply, irrigation, hydropower)
<p>B. WATER SUPPLY AND SANITATION SUBSECTOR (In addition to A)</p> <p>B. WATER SUPPLY AND SANITATION SUBSECTOR (In addition to A) (cont.)</p>	<ol style="list-style-type: none"> 1. Compliance with the Bank’s public utilities policy (regulatory, planning and water delivery functions in separate and independent entities) 2. Metering and cost recovery 3. Stakeholder and water users participation 4. Private sector participation in water supply and sanitation 5. Decentralization or municipalization 6. Capacity building of decentralized entities 7. Reduction of nonaccounted-for losses prior to development of new sources of supply 8. Regulatory mechanisms in place prior to privatization 9. Maintenance of investments 10. Financial sustainability 11. Long-term programming and investing by stages 12. Explicit relationship with the water resources sector, regulated by the water resources sector regulatory entity 13. Waste water disposal and treatment as an integral part of water supply 14. <i>Ecological</i> approach and <i>techniques</i> for waste water treatment 15. <i>Active</i> participation of <i>women</i> in project design and policy formulation 16. Explicit consideration of <i>policies for tariffs and subsidies</i> 	<ol style="list-style-type: none"> 1. Regulatory , planning, and water delivery functions within the same entity 2. Non transparent and non targeted subsidies (subsidies may be necessary in some cases for equity reasons) 3. Centralization 4. Nonaccounted-for losses 5. No relation to the water resources sector 6. Emphasis only on water supply with no consideration of wastewater disposal and treatment 7. Conflicts with other uses 8. Attention only in the provision of services without explicit consideration of the <i>institutional situation of the water resources sector, specially for the assignment of water rights and waste disposal permits</i>

Context	Examples of situations to encourage (important exceptions may occur)	Examples of situations to discourage (important exceptions may occur)
C. IRRIGATION AND DRAINAGE SUBSECTOR (In addition to A)	<ol style="list-style-type: none"> 1. Cost recovery 2. Management of irrigation units by farmers and/or user associations 3. Added emphasis on in-farm operations 4. Rehabilitation of existing systems 5. Economic incentives for water conservation, especially groundwater 6. Maintenance of investments 7. Financial sustainability 8. Complementarity with other uses 9. Farm drainage as part of the project 10. Adequate disposal of irrigation return flows as an integral part of the project 11. Explicit consideration of policies for tariffs and subsidies 	<ol style="list-style-type: none"> 1. Nontransparent, nontargeted and nontemporal subsidies (Subsidies may be considered as exceptions. If so, they must be transparent, targeted and temporal) 2. Emphasis only on main delivery and drainage systems without consideration for in-farm drainage 3. Groundwater depletion 4. Conflicts with other uses
D. HYDRO-ELECTRIC SUBSECTOR (In addition to A)	<ol style="list-style-type: none"> 1. Compliance with the energy strategy of the Bank 2. Economic efficiency and effectiveness of tariffs 4. Financial sustainability 5. Complementarity with other uses 6. Integration of hydroprojects with regional river basin development within broader guidelines for natural resource optimization, whenever possible 7. Private sector participation 	<ol style="list-style-type: none"> 1. Isolated projects 2. Conflicts with other uses 3. Non consideration of environmental or river basin optimization guidelines, whenever possible 4. Non consideration of upstream and downstream effects on and of impoundments, such as resettlement, erosion and sedimentation, river bank instability, changes in water quality, effects on fish and wildlife

TABLE 5: SIMPLIFIED OVERVIEW

GUIDING PRINCIPLES OF THE STRATEGY	STRATEGIC INSTRUMENTS	LEVELS OF ACTION FOR THE BANK	PRINCIPAL ACTORS IN THE DECISION MAKING PROCESS	TYPES OF PROBLEMS	MAIN ASPECTS TO BE ASSESSED	IDB INSTRUMENTS	SUPPORTING ACTIONS
<p>Promote comprehensive national water resources management policies and strategies</p> <p>Focus on capacity building</p> <p>Attention to long-term efforts</p> <p>Conforming to Bank's and countries objectives</p> <p>Incentives for country involvement and Bank coordination</p> <p>Cooperation and coordination international organizations</p>	<p>Capacity building</p> <p>Stakeholder participation</p>	<p>Constitutional</p> <p>(Water policy and law)</p>	<p>Heads of State</p> <p>Congress persons</p> <p>Ministers</p> <p>Politicians</p> <p>NGOs</p> <p>Lobbying and pressure groups</p>	<p>Non-existent, inadequate or non-complied integrated water resources management rules</p> <p>_____</p> <p>Medium to long-term time frames</p>	<p>Adequacy of country (province, state)-wide policy and legal instruments</p> <p>Constraints to integrated water resources management</p>	<p>Country dialogue</p> <p>Sector and hybrid loans</p> <p>Technical cooperations and trust funds</p>	<p>Diffusion and outreach</p> <p>Assessment studies in selected countries</p> <p>National and regional technical cooperations</p> <p>Strategy and action plan for integration of fresh water ecosystems</p> <p>Components of projects in Bank's pipeline</p>
<p>Focus on institutional innovation and capacity building</p> <p>Attention to both short and long-term efforts</p> <p>Conforming to Bank's and countries objectives</p> <p>Incentives for country involvement and Bank coordination</p> <p>Coordination and cooperation international organizations</p>	<p>Capacity building</p> <p>Decentralization</p> <p>Cost recovery</p> <p>Tradable water rights</p> <p>River basin councils</p> <p>Stakeholder participation</p>	<p>Organizational</p> <p>(Water resources management)</p>	<p>Deputy Ministers</p> <p>Directors</p> <p>Middle managers</p> <p>Private organizations</p> <p>River basin councils</p> <p>Sectoral regulatory or coordination agencies</p>	<p>Non-existent, inadequate or non-complied plans, programs and instruments for efficient utilization of water, for water allocation and conflict resolution</p> <p>_____</p> <p>Short to medium-term time frame</p>	<p>Rules (strategies, plan, programs, regulations)</p> <p>Approach (sub-sectoral or integrated; development or management) and its effectiveness</p> <p>Actors and their participation</p> <p>Coordinating mechanism (entity) and its effectiveness</p>	<p>Technical cooperations and trust funds</p> <p>Sector and hybrid loans</p> <p>Components of project specific loans</p>	<p>Diffusion and outreach</p> <p>Assessment studies in selected countries</p> <p>National and regional Technical cooperations</p> <p>Regional data management studies for future loans</p> <p>Pilot projects through regional TCs</p> <p>Components of projects in Bank's pipeline</p> <p>New projects</p>

GUIDING PRINCIPLES OF THE STRATEGY	STRATEGIC INSTRUMENTS	LEVELS OF ACTION FOR THE BANK	PRINCIPAL ACTORS IN THE DECISION MAKING PROCESS	TYPES OF PROBLEMS	MAIN ASPECTS TO BE ASSESSED	IDB INSTRUMENTS	SUPPORTING ACTIONS
<p>Focus on innovation and capacity building</p> <p>Attention to short-term action</p> <p>Conforming to Bank's and countries objectives</p> <p>Incentives for Bank coordination</p> <p>Coordination and cooperation international organizations</p>	<p>Capacity building</p> <p>Cost recovery</p> <p>Tradable water rights</p> <p>River basin councils</p> <p>Private sector participation</p> <p>Stakeholder participation</p>	<p>Organizational (Water use)</p>	<p>Municipalities</p> <p>Communities</p> <p>Water-user associations</p> <p>NGOs</p> <p>Individual users</p> <p>Entrepreneurs</p> <p>Regulatory sub-sectoral agencies</p>	<p>Social well-being</p> <p>Conservation of freshwater ecosystems</p> <p>_____</p> <p>_____</p> <p>Scarcity</p> <p>Externalities</p> <p>Open access</p> <p>Public interest</p> <p>_____</p> <p>_____</p> <p>Short-term time frame</p>	<p>Problem identification and classification</p> <p>Actors and nature of their participation</p> <p>Characteristics of the environment (natural and/or man-made)</p>	<p>Project specific loans</p> <p>Loans to private sector</p> <p>Small-project loans</p>	<p>Diffusion and outreach</p> <p>Assessment studies in selected countries</p> <p>Projects and components of projects in Bank's pipeline</p>

ANNEX I

DECLARATIONS REFLECTING THE INTERNATIONAL CONSENSUS

The **DUBLIN PRINCIPLES** (1992) have been universally adopted by the water resources community to guide the use of water for sustainable development:

- C Fresh water is a finite and vulnerable resource, essential to sustain life, development and the environment;
- C Water development and management should be based on a participatory approach, involving users, planners and policy-makers at all levels, and making decisions at the lowest appropriate level;
- C Women play a central part in the provision, management and safeguarding of water;
- C Water has an economic value in all its competing uses and should be recognized as an economic good.

These have been updated in Stockholm (1996) and presented for adoption by the **GLOBAL WATER PARTNERSHIP**:

- C Recognition that water is a finite global resource essential for human survival;
- C Agreement to follow integrated approaches to sustainable water resources management;
- C Wish to coordinate activities in water resources management with those of other organizations;
- C Aim to help people, especially the poor and other vulnerable groups, to benefit from improved water resources management, while safeguarding the environment;
- C Recognition that women play a central part in the provision, management and safeguarding of water.

In Latin America and the Caribbean, they are also reflected in the **SAN JOSE DECLARATION** (1996):

- C Water resource agencies, along with other appropriate s and communities, should co-ordinate and integrate their efforts for the development of national policies, strategies, legislation and standards; and in addition, programs should reflect the socio-economic and environmental needs of countries and serve the interests and needs of water users at the local and community level with due regard to conservation of natural resources and bio-diversity.

As well as in the **DECLARATION OF BUENOS AIRES** (1996):

- C Strengthen water resources management through improved policies and information;
- C Establish mechanisms to address transboundary water resources issues;
- C Strengthen the capacity of nations to develop and manage water resources in the context of sustainable development;

SOURCES: UNDP (1994), GW P (1996), WMO /IDB (1996), OAS (1996).

ANNEX II
DIFFERENT FORMS OF PRIVATE SECTOR PARTICIPATION
IN THE PROVISION OF PUBLIC SERVICES

Types of institutional forms by increasing degree of private responsibility	
!	Public provision
!	Service contract
!	Management contract
!	Leasing
!	Concessions (including BOT, etc.)
!	Cooperative and communal arrangements
!	Private entrepreneurship (with majority private shareholding)

Distribution of responsibilities under different forms of private sector participation

Responsibility	Private or Cooperative	Concessions (Including BOT)	Leasing	Services contracts	Management contracts
Ownership of assets	Private	State or mixed	State or mixed	State or mixed	State or mixed
Investment planning and regulation	None or state agency	State negotiated with contractor	Contractor or separate state agency	Contractor or separate state agency	Contractor or separate state agency
Capital financing	Private	Private	Public	Public	Public
Working capital	Private	Private	Private	Public	Public
Execution of works	Private	Private	Public	Private as specified	Public
Operation and maintenance	Private	Private	Private	Private as specified	Private
Management authority	Private	Private	Private	Public	Private
Commercial risk	Private	Private	Private	Public	Mainly public
Basis of compensation	Privately determined	Based on results	Based on results	Based on services rendered	Based on services and results
Typical duration	Indefinite	10-30 years	5-10 years	Less than 5 years	About 3-5 years

SOURCE: ECLAC (1995), after Kessides (1993)