

Development of Effective Water-Management Institutions

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Implementing Integrated Water Resources Management in the Philippines¹

Introduction

The Philippines has achieved modest gains in implementing integrated water resources management (IWRM) concepts. The basic laws, regulations, policies and the institutional framework have long been adopted. The current water resources sector development efforts are oriented towards adjustments to maintain consistency with socioeconomic policies, implementation of programs for capacity building, particularly for the National Water Resources Board (NWRB), and the development of strategies for the strict and wider implementation and enforcement of existing laws and regulations.

The water resources sector in the Philippines has undergone, and continues to undergo, rapid twists and turns as it tries to keep up with the demands and challenges posed by population growth, urbanization and overall increased economic activity. Government and private-sector investments in development projects have generally maintained a focus on sustainability and conservation of the environment, including water resources.

The purpose of this report is to assess and analyze sector efforts, initiatives and experiences in instituting appropriate policies, working arrangements and projects—both successes and failures—to promote IWRM. This report identifies particular conditions and issues that have enabled or inhibited the successful implementation of policy intentions. It also assesses the appropriateness of the chosen policies, relative to the desired objective of IWRM. The report identifies strategic areas for further research and policy initiatives to make Philippines' efforts towards making improved IWRM more effective. Where appropriate, commentaries are offered and marked in various parts of the report.

The report is based on a review of literature available both locally and internationally, with particular reference to government documents on related laws and procedures, and policy statements. Visits and discussions were done with key stakeholders and other persons who have, in one way or another, participated or are participating in the water-resources-management process. In this report, the implementation of IWRM in the Philippines will be traced by looking at specific endeavors and innovations, related to:

Establishing the enabling environment for IWRM.

- Promulgation of key legislation and policy decisions.
- Promotion of river basin-focused planning and management.
- Introduction of economic pricing of raw water.

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Organizing appropriate institutional roles.

- Institutional and regulatory arrangements; increased local decentralization and autonomy of local administration.
- Stakeholders' participation, including involvement of the private sector and citizens.

Implementation of practical management tools.

- Implementation of a water use permit and regulation system.
- Development of a coordinated water-resources data management system.

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The average annual rainfall in the country is about 2,400 mm. This translates to a total annual renewable freshwater supply available of about 323 km³ or about 4,400 m³ per capita. This is more than 4 times the threshold of 1,000 m³ used for classifying water scarcity. Freshwater availability, however, is expected to decline to about 2,500 m³ per capita by the middle of the next century. However, some isolated areas in Central Luzon, Central Visayas and Southern Mindanao have started to experience occasional periods of water stress. In addition, prolonged periods of rainfall, inadequate urban drainage facilities and degradation of watershed areas have contributed to major flood situations.

Overview of Sector Status, Strategies and Targets (2001-2004)

Water Supply, Sewerage and Sanitation

There are three major areas of responsibility in this subsector: a) Metro Manila, which is served mainly by the Metropolitan Waterworks and Sewerage System (MWSS) through its two concessionaires, Manila Water Company, Inc. (MWCI) and Maynilad Water Services, Inc. (MWSI); b) provincial urban areas, served by local water districts, local government units (LGUs) and private utilities; and c) provincial rural areas, served by Rural Waterworks and Sanitation Associations (RWSAs), Barangay Waterworks and Sanitation Associations (BWSAs) and LGUs. Table 1 shows the water supply, sewerage and sanitation strategies and measurable targets (2001-2004).

The total population directly served by MWSS through its two concessionaires as of December 2001 is 9.5 million (M) or 82 percent of the 11.6 M total population under the MWSS service area. However, the problem of nonrevenue water (NRW) persists, particularly in the west zone under MWSI as NRW increased from 66.2 percent in 2000 to 67 percent in 2001.

Around 26.7 M or 55 percent of the country's rural population are now being served still with mostly point sources systems (120.2 M) and, in some cases, with public faucet systems (2.9 M) and piped distribution systems (3.6 M) by LGUs, BWSAs and RWSAs with support from the Department of the Interior and Local Government (DILG) and the Department of Public Works and Highways (DPWH). Private utilities serve a further 0.5 M or 1.4 percent of the country's rural population and 0.2 M or about 2.2 percent of Metro Manila.

The provincial urban population served by local water districts as of 2001 was 10.8 M, which is 50.7 percent of the total population in urban areas outside MWSS coverage. The average NRW of water districts stood at 29 percent in 2001, lower by 2 percentage points from the 31 percent in 2000.

In Metro Manila, sewerage and sanitation services are expected to increase once the Manila 2nd Sewerage Project (MSSP) is completed. The Department of Health (DOH) and DILG, meanwhile, will continue to assist LGUs in providing basic sanitation services.

Information on health and environment at different levels of population and on geographical aggregation is necessary in order to support the management and decision-making process in relation to environmental health. Providing relevant information, within the constraints of time and other resources, is thus a major challenge.

Table 1. Water supply, sewerage and sanitation strategies and measurable targets, 2001-2004.

Water supply, sewerage and sanitation strategies	Measurable targets (2001-2004) ²								
<ol style="list-style-type: none"> 1. Provide a favorable environment for LGUs, with assistance from concerned government agencies in the provision of services for water supply, sanitation and sewerage. 2. Continue to encourage private-sector participation (PSP) of water supply facilities in other urban areas whenever appropriate. 3. Enhance information campaign and training in proper liquid waste disposal and ecological and environmental preservation with special emphasis on women's participation. 4. Develop and provide incentives for contiguous water districts to amalgamate into single business entities to attain economy of scale in project development cost. 5. Encourage water utilities to evolve/graduate into different institutional types, based on their level of viability, as follows: <table style="width: 100%; border-collapse: collapse; margin-top: 10px;"> <thead> <tr> <th style="text-align: left; border-bottom: 1px solid black;">Level of viability</th> <th style="text-align: left; border-bottom: 1px solid black;">Institutional type</th> </tr> </thead> <tbody> <tr> <td>Small urban areas (nonviable)</td> <td>Municipal/community-owned water utilities</td> </tr> <tr> <td>Medium-sized urban areas (viable)</td> <td>Water districts</td> </tr> <tr> <td>Big urban areas (highly viable)</td> <td>Water districts/ Utilities with PSP</td> </tr> </tbody> </table> 6. Pursue the preservation of the environment, particularly the maintenance and development of watershed areas and touristic attractions. 7. Ensure the financial and technical performance of water utilities to address the sustainability of water supply. 	Level of viability	Institutional type	Small urban areas (nonviable)	Municipal/community-owned water utilities	Medium-sized urban areas (viable)	Water districts	Big urban areas (highly viable)	Water districts/ Utilities with PSP	<ul style="list-style-type: none"> • Targets for the plan period 2002-2004 are presented in terms of the increased number of persons served. MWSS is expected to extend its services to a population of some 8.5 M in Metro Manila while it is expected that a population of 22 M would benefit in other urban centers outside Metro Manila. In rural areas, 4.235 M of the population will be benefited. • In terms of percentage coverage, 90.38 percent of the total population in the rural areas shall be served; while around 90 percent and 89.60 percent in Metro Manila and other urban centers, respectively, shall be served. • Total population to be provided with household latrines shall reach 131,380 within the plan period, raising coverage of the individual household sanitation facilities to around 75.89 percent of the population. 250 school and public toilets will be provided by the DOH.
Level of viability	Institutional type								
Small urban areas (nonviable)	Municipal/community-owned water utilities								
Medium-sized urban areas (viable)	Water districts								
Big urban areas (highly viable)	Water districts/ Utilities with PSP								

²Targets for the water supply and sanitation have not been updated as yet.

Irrigation

At the end of 2001, the total area with irrigation facilities reached about 1.374 M hectares, benefiting about 1 M farm-families. This represents 43.94 percent of the country's potential irrigable area of 3.126 M hectares that is primarily devoted to rice and corn. This area includes all national and communal irrigation systems constructed by the National Irrigation Administration (NIA) and other government entities. Table 2 shows irrigation strategies and measurable targets, 2001-2004.

Table 2. Irrigation strategies and measurable targets, 2001-2004.

Irrigation strategies	Measurable targets (2001-2004)
1. Intensify research and development and adopt cost-effective, appropriate and efficient irrigation and management technologies in coordination and cooperation with other relevant research institutions in the country.	<ul style="list-style-type: none"> • For the period 2002 to 2004, NIA targets the generation of 62,338 hectares and the rehabilitation of 217,648 hectares in existing irrigation systems. With the generation of these additional areas, the total area with irrigation facilities shall reach about 1.44 M hectares in 2004. A funding requirement for 2002 to 2004 of PhP 18.6 billion will be needed.
2. Review irrigation pricing policies, specifically 1SF, to recover the cost of O&M and consider the eventual expanded role of farmer-beneficiaries in the NIS.	
3. Adopt volumetric pricing of irrigation water.	<ul style="list-style-type: none"> • BSWM, likewise, plans to generate and rehabilitate existing irrigation systems serving 87,886 and 3,732 hectares, respectively. By the end of 2004, the irrigation facilities shall cover about 256,000 hectares with a total investment requirement from 2002 to 2004 amounting to PhP3.21 billion.
4. Coordinate, with DENR, the preservation and rehabilitation of watersheds to support and sustain the irrigation systems.	
5. Strengthen the participation of, and empower, the IAs in planning, development and O&M of irrigation systems through irrigation management transfer (IMT). Proper IA training and incentives will result in better system O&M. NIA will plan and implement a comprehensive IMT program with an implementation schedule and milestones as part of NIA's overall restructuring plan.	
6. Pursue the rehabilitation and improvement of national and communal irrigation systems, small water-impounding and diversion dam projects and other minor irrigation schemes, including canal lining and provision of silt excluders.	
7. Promote private-led development of irrigation schemes, such as shallow tube wells, low-lift pumps, small reservoir irrigation projects and other inundation systems.	
8. Encourage the construction of irrigation facilities through other viable schemes such as build-operate-transfer and build-transfer that will hasten development of irrigation systems.	
9. Enhance women's representation and participation in local development councils and provide adequate skills training and support to improve capability for more meaningful participation in activities of the subsector.	

For 2000 and 2001, targets of NIA were 67,903 hectares for the irrigation of new areas and 257,347 hectares for the rehabilitation of existing systems. Actual accomplishments were 32,136 hectares of newly irrigated and 216,380 hectares of rehabilitated land. The funding requirement for irrigation for the period 2000 to 2001 totaled PHP22.11 billion. The approved programs were PHP6.76 billion and PHP4.76 billion for 2000 and 2001, respectively, representing only 52.1 percent of the total funding requirement.

The DA-BSWM and the DA-Regional Field Units (RFUs) complemented the efforts of NIA by implementing small water impounding projects, small diversion dams, small farm reservoirs, and shallow tube wells as part of their task on soils and water management and conservation.

For 2000 and 2001, targets of these offices were 6,971 hectares for the irrigation of new areas and 4,256 hectares for the rehabilitation of existing systems. Actual accomplishments were 2,922 hectares of newly irrigated and 2,108 hectares of rehabilitated land catering to the needs of 6,423 farmer-beneficiaries. Most of the projects were implemented through cost-sharing with local government units, which gave rise to strong partnership with the local government in terms of accountability.

In 2001, rice production which was estimated at 12.95 M metric tons was 4.56 percent higher than the 2000 record. The improved production performance was due to increases in area harvested and yield for the year attributable to favorable weather conditions, better irrigation systems and use of certified seeds through the DA-National Food Authority assistance package program. Major gains were recorded in the regions of Autonomous Region of Muslim Mindanao, Central Luzon, Central Mindanao, Cordillera Autonomous Region and Eastern Visayas in the third quarter of 2001. On the other hand, the production of corn in 2001 reached 4.53 M metric tons, 0.31 percent higher than in 2000. The production increase could be traced to the increase in yield. Agriculture recorded a 4.01 percent growth in 2001. The sector's gross value of production in 2001 amounting to PHP621.4 billion at current prices was 5.57 percent higher than the previous level.

Flood and Drainage Management

By the end of 2000, the total area provided by DPWH with river control and drainage facilities was about 305,725 hectares. This represents 62.03 percent of the total potential coverage area of 492,831 hectares. Although reduced in many parts of the country, flooding is still a major concern together with erosion and sediment control, the main causes of which are a) deterioration of some rivers and streams in flood plains and delta areas due to encroachment on their natural channels, b) indiscriminate mining operations and deforestation of watershed areas, c) indiscriminate dumping of solid waste, d) rapid urbanization resulting in increased runoff, and e) deficiencies in technical standards and regulations, organization and budget for continuous O&M, rehabilitation and improvement of existing facilities and natural channels. Table 3 shows flood control and drainage strategies and measurable targets, 2001-2004.

Extensive networks of flood management measures (i.e., dikes, river walls, river and dredging for channel improvement) have been undertaken in major river basins, in particular, Agno, Cagayan, Pampanga, Bicol and Agusan. In Ormoc City, Phase I of a JICA-assisted Flood Mitigation Project involving the construction of three slit dams and reconstruction of five bridges, has been substantially completed. In Butuan City, Phase I of the Lower Agusan Development Project involving the construction of a 10.6-km embankment levee, a 5.28-km concrete floodwall, including related structures, such as floodgates and drainage sluices and dredging works of the Agusan river, was completed in 1999. Major components of the flood and drainage management program in Metro

Table 3. Flood control and drainage strategies and measurable targets, 2001-2004.

Flood control and drainage strategies	Measurable targets (2001-2004)
<ol style="list-style-type: none"> 1. Mitigate flooding to tolerable levels in Metro Manila and major river basins with the additional construction or installation of flood-management facilities; 2. Support flood-management projects to address economic development and poverty alleviation through the reduction of flood damages. Technical assistance in implementing a forecasting/warning system will be pursued with other agencies and LGUs. 3. Strengthen the Flood Control & Sabo Engineering Center to conduct basic and applied research and development, feasibility studies, human-resources development and preliminary engineering. 4. Conduct a comprehensive floodplain management strategy with the installation of flood forecasting and warning systems in all major river basins. 5. Pursue proper O&M of flood and drainage management facilities including an effective solid waste collection and disposal, Bantay Estero/Ilog Brigades and regulation/rules in coordination with other concerned government agencies and LGUs. 6. Coordinate the development of flood management projects with the implementation of water-resources development projects. 7. Relocate and prevent informal settlers living along the banks of rivers/esteros/creeks. 8. Implement sabo projects for the prevention/mitigation of sediment-related disasters, debris and lahar flow/landslides. 9. Study and formulate guidelines leading to sustainable development /land use in sediment-related disaster-prone areas. 10. Implement comprehensive measures consisting of construction, warning/evacuation and livelihood programs in coordination with concerned agencies and LGUs. 11. Legislate an Act creating a National Commission on Flood and Drainage Management Research and Development. 12. On solid waste management, implement at source the reduction/minimization of solid waste generation. The efficiency and effectiveness of transfer and transport system from source to processing of solid waste will be improved. 	<ul style="list-style-type: none"> • The projected total area to be “flood-proofed” in 2001-2004 is about 1.4 M hectares. The total area with flood and drainage facilities is about 1.70 M hectares or 87.57 percent of the total target. The total investment requirement for the program is about PhP34.79 billion. • The government will provide adequate structures, especially for Metro Manila and other highly urbanized industrial centers. In lahar areas, dredging and desilting activities will be continued. • The priority flood management projects to be implemented are in the following areas: Agno river, Laoag river, Lower Cagayan river, Mt. Pinatubo Rehabilitation, Iloilo river, Lower Agusan, Lower Cotabato, West Manggahan, KAMANAVA (Kaloocan, Malabon, Navotas and Valenzuela), and Pasig river in Metro Manila.

Manila have been built, particularly additional drainage mains, pumping stations including the recently completed Balut, Vitas and San Andres pumping stations, estero improvement works, dredging and related facilities. These have substantially decreased the length of time for floods to subside in Metro Manila.

Destructive landslides, debris flows and riverbed deformations remarkably increase damages to lives, properties and infrastructure. Sediment control measures, although still inadequate, are continuously pursued, especially in areas influenced by Mt. Pinatubo and Mt. Mayon. The immediate need, therefore, is for effective prevention programs in disaster-prone areas. These include structural and nonstructural measures such as warning and evacuation systems, and land-use regulation and disaster preparedness programs.

Hydropower

At present, the total installed hydropower capacity in the country is estimated at 2,524.32 megawatt (MW) of which 2,434.1 MW are large and small hydros, 89.7 MW are mini-hydros and the remaining 0.52 MW are micro-hydros. The micro-hydro capacity generally supplies electricity to off-grid barangays dedicated for rural electrification. Hydropower contributed an average of 6,761.61 Gigawatt-hours (GWh) of electricity to the country's energy mix from 1997 to 2001, displacing 11.7 M barrels of fuel oil equivalent (MMBFOE). This constitutes an equivalent foreign exchange saving of about US\$274.72 M. Table 4 shows hydropower strategies and measurable strategies, 2001-2004.

Hydropower performance in 2001 declined to 7,034 GWh from 7,799 GWh in 2000. However, the 2001 generation surpassed by 25 percent the Philippine Energy Plan (PEP) target of 5,649 GWh for 2001. Actual installed hydropower capacity stood at 2,524.32 MW as against the target of 2,522 MW for year 2001. The slight increase was due to the completion and start of operation of the 140 MW Casecanan, 7 MW Bubunawan and unit 2 of the 35 MW Bakun hydropower projects.

Table 4. Hydropower strategies and measurable strategies, 2001-2004.

Hydropower strategies	Measurable targets (2001-2004)
1. Enhance public acceptance.	<ul style="list-style-type: none"> • In the Philippine Energy Plan 2003-2012, about 2,565 MW of hydropower capacity will be available within the off-grid areas. This additional capacity will increase the available overall hydropower capacity to 5,091 MW resulting in an average annual generation of 16,533 GWh displacing 28.51 MMBFOE. • Hydropower resource potential is estimated at 10,530 MW of which more than 80 percent is considered as large hydros (8723MW); around 1,780 MW are classified as minihydros and 27 MW are micro-hydros. In Luzon, pre-feasibility studies on 20 large hydro projects are ongoing while 82 are in the pre-feasibility stage. In the Visayas, 5 large hydro projects have ongoing feasibility studies and 10 projects in the pre-feasibility stage. Mindanao has 10 hydro projects with feasibility studies and 36 projects with pre-feasibility studies.
2. Promote and intensify development of run-of-river (cascade) type hydropower projects.	
3. Improve and update the hydropower data base for reference and investment.	
4. Conduct annual seminars and workshops on hydropower development for promotion to private investors.	
5. Pursue technical cooperation with other countries to hasten transfer of hydropower technology and commercialization of locally manufactured turbine equipment.	
6. Rehabilitate and upgrade existing hydropower plants.	

Water Resources Policy Reform Milestones Promoting IWRM in the Philippines

Rio-Dublin Principles (1992)

The Philippines has been an active participant in various global meetings and consultations that led to new thinking about environment and water management. Four fundamental principles were proposed at the International Conference on Water and the Environment (ICWE) in Dublin and adopted at the United Nations Conference on Environment and Development (UNCED 1992) in Rio de Janeiro. The Rio-Dublin principles, addressing the freshwater problems, have been the primary guidepost for IWRM. Briefly, the principles reiterate that:

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

National Water Summits of 1994

In 1994, the former President Ramos took a direct hand in addressing the water resources issues by organizing the National Water Summits of 1994. At the end of two separate stakeholders' summits, the participants pointed to the need to properly manage the nation's water in a sustainable manner and to implement a clear and focused approach for integrating and coordinating all water-resources management efforts. The Summit also called for strengthening the institutional mechanisms for closer coordination among water-related agencies. One bold move in this direction was the initiative to upgrade the authority and responsibility of the NWRB.

The President's response to the Summit was the reconstitution of Cabinet Cluster G into a Water Management Cluster. A "cabinet cluster" is a high-level working group of department functionaries in charge of specific priority issues and concerns. This cluster continues to serve as the advisory committee to the President and the Cabinet on all policy issues on water resources. This shift in official thinking and action was a milestone for the water resources sector. Then President Ramos took a direct hand and interest in the management of the sector.

Water Crisis Act of 1995

Soon after the National Water Summits of 1994, Congress enacted Republic Act No. 8041 (National Water Crisis Act of 1995). The law intended to address the problems and ill-effects spawned by the prevailing water crisis. The major change introduced by the Act was the creation of a Joint Executive-Legislative Water Crisis Commission chaired by the Executive Secretary (to the President). The Act conveyed a sense of urgency in the effort to resolve the crisis. The powers and purposes of the Commission included the following:

- To undertake nationwide consultations on the water crisis and a study of the entire water-supply and distribution structure.
- To facilitate coordination between Congress and the executive department in formulating and implementing the government's water-crisis management policy and strategy.
- To recommend measures to ensure continuous and effective monitoring of the entire water-supply and distribution system.
- To conduct studies on policy options and strategies to resolve the water crisis and recommend remedial legislative measures.

The Act, in part, was also intended to provide immediate relief from the El Niño effects on the country (urban metropolitan Manila, in particular). The Act paved the way for the faster implementation of projects of the Metropolitan Waterworks and Sewerage System (MWSS). It authorized the President to enter into negotiated contracts (BOT and its variants) and/or related schemes for the financing, construction, repair, rehabilitation, improvement and operation of water facilities and projects. The Act also authorized the privatization of MWSS and the Local Water Utilities Administration (LWUA). It empowered the President to reorganize MWSS and LWUA or to abolish or create offices and transfer functions, equipment, properties, records and personnel.

Presidential Task Force on Water Resources Development and Management (1996)

Another key initiative for addressing the water crisis is the issuance of Executive Order No. 374 in October 1996 creating the Presidential Task Force on Water Resources Development and Management (PTFWRDM). The PTFWRDM was primarily tasked to coordinate projects and programs of member agencies to ensure efficient management, development and protection of the country's water resources. The task force was envisaged as an oversight body to ensure the efficient exploitation and use of water resources. Its basic responsibility was to develop and evolve policy and program recommendations on:

- Water supply planning and coordination and efficient allocation of water resources to the different users.
- Prioritization of programs and projects to ensure sustainable, adequate, safe and affordable water supply.
- Coordination and monitoring of water policies and programs; and pricing policies on water resources.

The task force again consisted of senior, high-level officials. The Secretary of the Department of Environment and Natural Resources (DENR) presided as Chairman; while the Executive Director of NWRB was the Vice Chair. This agency was composed of 21 water-sector agencies (18 government and 3 private) including the cabinet secretaries of the departments of energy, health, agriculture and interior and local government; the presidents of the League of Provinces and League of Municipalities, and the administrators of MWSS and of LWUA. The private sector was

represented by environmental activists, and water management and consumers' groups designated by the task force chairman.

Commentary

The task force essentially placed an additional tier in the institutional hierarchy for management of the water-resources sector. The role and responsibilities duplicated the policy functions of NWRB but it drew inputs from a wider range of stakeholders. To an extent, it reflected the inadequacy of the then prevailing structure of NWRB. The task force was subsequently abolished in 2002 as the NWRB composition was reconstituted and its "sphere of influence" widened. The President could not amend the law defining NWRB; however, he created temporary institutional structures while the changes in legislation were being debated and approved. As the legislative amendments came into effect, these "special" structures were adopted into the new arrangements.

Regional Meeting on Water Resources Management in Southeast Asian Countries (1997)

The Philippines also participated in a Regional Meeting on Water Resources Management in Southeast Asian Countries in Manila, June 1997 organized by the Global Water Partnership-Technical Advisory Committee (GWP-TAC) and the Asian Development Bank (ADB). This meeting reinforced and called for the adoption of IWRM to guide the national water resources policy. GWP-TAC defines IWRM as: "...a process which promotes the coordinated development and management of water, land and related resources, in order to maximize the resultant economic and social welfare in an equitable manner without compromising the sustainability of vital ecosystems" (GWP-TAC 2000).

The adoption of IWRM highlighted the importance of making informed decisions to balance and trade off, in a practical, acceptable and rational way, various desired policy objectives, including:

- *Economic efficiency in water use.* Due to the increasing scarcity of water and financial resources, the finite and vulnerable nature of water as a resource and the increased demands for it, water must be used with maximum possible economic efficiency in order to ensure social welfare and contribute to the reduction of poverty.
- *Social justice and equity.* The basic right of all people for access to water of adequate quantity and quality for the sustenance of human well-being must be universally recognized.
- *Environmental and ecological sustainability.* The present use of the resource should be managed in a way that sustains the vital life-support systems, thereby not compromising the use of the same resource by future generations.

Medium-Term Philippine Development Plan (2001-2004)

Resource concerns during the late 1990s contributed to a major sense of uneasiness among the economic planners and the water agencies themselves. In addition to the dwindling resources for capital investment and operation and maintenance (O&M) and the internal inefficiencies of the institutions, the need to address macro level and interagency coordination issues was expressed. The IWRM framework (approach) presented a conceptual framework for viewing and assessing much of what were already in place and defining the other gaps in the policy framework.

The Philippine Government has since formally and officially recognized IWRM as the strategy for achieving coordinated and balanced water use and allocation. In the Philippines, IWRM is defined³ as the “coordinated development and management of water, land and related resources to optimize economic and social welfare without compromising the sustainability of vital environmental systems (within the water resources regions).” This is now explicitly laid out in the Medium-Term Philippine Development Plan (2001-2004).

Current Policies, Principles and Strategies

Devolution of Authority and Responsibility

With the decentralization and streamlining, new projects are coming online at a time of intense public administration reform and policy initiatives. Clearly, the responsibility for ensuring the availability of basic public services now rests with the local government units (LGUs). This, however, does not necessarily mean that the LGUs have to be the direct provider of the services. Such service provision functions can be delegated to user groups or other public or private institutions. Having delegated such functions, the LGUs are then envisaged to focus on policies to promote and regulate services to ensure adequacy, efficiency and effectiveness. These changes are brought on by the increasing public demand, strengthening democratization processes, dwindling resources and broader private sector participation in what have been traditionally government endeavors.

Self-Reliance and Local Community Management

One clear policy shift has been towards the promotion of self-reliance and local community management of services to promote sustainability. Since the seventies, formation of local water districts in provincial urban areas and farmers’ irrigation cooperatives has been aggressively pursued. Rule 30.1 of the Agriculture and Fisheries Modernization Act states that the NIA, “... in consultation with the Department of Agriculture, Irrigators’ Associations (IAs) and other relevant entities, shall accelerate and complete the turnover of O&M of secondary canals and on-farm structures of the national irrigation systems to the management and O&M by IAs.” During the eighties, this shift was further induced with the establishment of community-run BWSAs and RWSAs for drinking water supply and sanitation. Delays in the institutional response to the policy shifts have invariably contributed to the recent decline in overall subsector activity level.

³NEDA Draft Paper of the NEDA Technical Working Group on Integrated Water Resources Management. Text in parenthesis is a recent addition proposed by NWRB, 2002.

Cost Recovery

Drinking water supply. The current practice for cost recovery varies for the different services of water delivered. For urban water supply (Level III), services are provided on the basis of recovery of full costs. In the case of rural water supply (Level I & II), cost recovery through user charges is only for the O&M of the systems.

Recovery of capital and O&M is promoted in urban areas for piped water systems; partial recovery of operating costs and cross-subsidization in low-income areas are advocated. This is a clear switch from subsidies which typified previous strategies. The current national policy provides grants to cover capital costs for Level I systems; communities, however, have to establish an O&M reserve fund and are responsible for all maintenance and operating costs. Water source development is provided as grants for Level II systems; full cost recovery is required for all other capital costs. Recovery of full capital and O&M cost is required for Level III systems. The trend is towards the reduction of subsidies of all forms (grants and soft loans) and the creation of revolving funds. Current priorities also stress the need to improve the collection of service tariffs and charges.

Irrigation. Full cost recovery of O&M remains a government policy as embodied in the Agriculture and Fisheries Modernization Act of 1997 (RA 8435). The O&M costs of national irrigation systems (NIS) are recovered through the collection of Irrigation Service Fee (ISF) from the farmer-beneficiaries. Direct construction costs of communal irrigation systems (CIS) are amortized by the farmer-beneficiaries through their Irrigator Associations (IAs) on terms agreed upon by IAs and NIA.

Hydropower generation. Services are provided on the basis of recovery of full cost.

Private-Sector Participation

Private-sector participation is encouraged to bring into the sector commercial principles and practices and private capital to accelerate social and economic development; to improve sector efficiencies, and to ease the burden on the national budget and foreign borrowings.

Integrated Water-Resources Strategy

An integrated water-resources strategy has been adopted in areas combining irrigation, power, flood control, and domestic and industrial water supply. Watershed management, water conservation and erosion and sediment control are deemed critical. Sector development shall be consistent with broader concerns for the environmental protection and management. An integrated approach to water, sanitation and hygienic education has been prescribed to achieve full health benefits of improved services. The Government of the Philippines supports intensified health education and information programs to improve hygienic practices at the household level.

Selection and prioritization of projects are based on demonstrated commitment of the beneficiaries to participate in the project, willingness to pay, the current water and sanitation and overall health conditions, potentials for growth and the project costs. A program to support the formulation and updating of provincial-sector master plans has been ongoing in the last 5 years.

Technology to be used for the projects shall be appropriate to the local conditions and resources. Where possible, phased upward integration and future upgrading of systems and facilities will be promoted utilizing, as far as possible, previously constructed facilities.

Establishing the Enabling Environment for IWRM

The *enabling environment* comprises national, provincial and local policies and legislation. These constitute the “rules of the game,” which enable all stakeholders to play their respective roles towards the sustainable utilization and conservation of water resources.

Legislation and Legal Framework for Water Resources Management

The legal environment in which the management of water resources in the Philippines is found in the Constitution is a compendium of laws, statutes, decrees, orders, rules and regulations and proclamations of competent legal authorities. These water and water-related laws are wide-ranging, complex and diverse; they have been amended from time to time to reflect changing demands, policies and politics. The key elements are outlined in the succeeding sections.

The Philippine Constitution (1987)

Section 2, Article XII of the Constitution lays the basis of national policy on water as a natural resource. The Constitution declares that “All lands of the public domain, waters, minerals, coal, petroleum and other mineral oils, all forces of potential energy, fisheries, forests or timber, wildlife, flora and fauna, and other natural resources are owned by the State. The exploration, development and utilization of natural resources shall be under the full control and supervision of the State. In cases of water rights for irrigation, water supply, fisheries or industrial uses other than the development of water power, beneficial use may be the measure and limit of the grant.”

Public Service Law (Commonwealth Act No. 146)

Commonwealth Act⁴ (CA) 146 prescribes a level of equity ownership by Filipino citizens in public utility corporations (power, water, transportation, etc.). The law sets such ownership to at least 60 percent (60%) of the capital stock of such corporations. Water distribution and sewerage systems are utilities that are classified as covered by the citizenship requirement under the Act. The other utilities covered are railways and urban mass transit, distribution (not production) of electricity and gas, telephone systems, wireless broadcast stations and any common carrier (either freight or passenger).

CA 146 established the former Public Service Commission (PSC). As a regulatory body, PSC consisted of various boards to regulate the operation of public utilities, including water utilities and other public services owned or operated by government entities. These boards issue a Certificate

⁴Commonwealth acts were laws enacted by the Philippine legislature during 1935-45 when the country was still under the United States.

of Public Convenience (CPC) for the operation of any public utility. However, for public-owned or operated utilities, CPCs are not required for their operation. The utilities are subject to the PSC's other regulatory authority. The Board of Power and Waterworks (BPW) of the PSC exercised regulatory authority over power and water utilities. When the BPW was abolished, its functions were transferred to the Board of Energy for power services and the National Water Resources Board for water utilities.

Civil Code of the Philippines (Republic Act 386)

Article 501, Section 1 (Ownership of Waters) of the Civil Code of the Philippines says (in part) that the following are of public dominion:

- Rivers and their natural beds.
- Continuous or intermittent waters of springs and brooks running in their natural beds and the beds themselves.
- Waters rising continuously or intermittently on lands of public dominion.
- Lakes and lagoons formed by nature on public lands, and their beds.
- Rainwater running through ravines on sand beds, which are also of public dominion.
- Subterranean waters on public lands.
- Waters found within the zone of operation of public works, even if constructed by a contractor.
- Water rising continuously or intermittently on lands belonging to private persons, to the State, to a province, or to a city or a municipality.
- The wastewaters of fountains, sewers and public establishments.

Some provisions of the Civil Code on ownership of water, easements relating to water, use of public water and acquisitive prescription on the use of water, have been repealed by the more recent Water Code. For instance, paragraph (2) of Article 504 of the Civil Code provides that use of public water could be acquired by "prescription for ten years." This provision is now considered repealed since it is inconsistent with Article 3 of the Water Code.

Water Code of the Philippines (Presidential Decree 1067)

The Water Code of the Philippines is the basic water law of the country. The Code consolidates legislation on the ownership, development, utilization, exploitation and conservation of water resources. It establishes the basic principles and framework for the appropriation, control and conservation of water resources to achieve their optimum economic efficiency and rational development. In addition, PD 424 declares that the National Water Resources Board (NWRB) shall be responsible for coordinating and integrating all activities related to water resources. PD 1067

also pertains to the grant of water right privileges (by permits) to the appropriate use of water. Water permit applications are reviewed and granted by the NWRB.

The objectives of the Water Code are to:

- Establish the basic principles and structural framework relating to the appropriation, control, conservation and protection of water resources to achieve their optimum development and efficient use, to meet present and future needs.
- Define the scope of the rights and obligations of water users and provide for the protection and regulation of such rights.
- Institute a basic law to govern the ownership, appropriation, utilization, exploitation, development, conservation and protection of water resources and rights to land related thereto.
- Identify the administrative agencies that will enforce the Code.

The Code is supported by a set of Implementing Rules and Regulations for effective enforcement of its provisions. Both documents provide the basic framework for water-resources management and define the rights, obligations of water users and the protection and regulation of those rights. The Law also defined the institutional arrangements (powers, duties and responsibilities) for enforcement of the Code.

The fundamental principle adopted in the Code is that all water resources belong to the State and are not therefore, subject to acquisitive prescription. The State may allow the use or development of water by administrative concessions, but the utilization, development, conservation and protection of water resources shall remain within the control of, and regulation by, the government. Preference in the use and development of water resources shall consider current usage and be responsive to the changing needs of the country.

“Water,” as defined in the Code, is all-inclusive. “Water, as used in this Code, refers to water under the ground, water above the ground, water in the atmosphere and the waters of the sea within the territorial jurisdiction of the Philippines” (Article 4). It thus includes all waters in their natural state or from the perspective of their source. Article 5 specifies that the following also belongs to the State: rivers and their natural beds; continuous or intermittent waters of springs and brooks running in their natural beds and the beds themselves, and natural lakes and lagoons. All other categories of surface waters such as water flowing over lands, water from rainfall (natural and artificial) and water from agricultural runoff, seepage and drainage; atmospheric water; subterranean or groundwater; and seawater all belong to the State.

Article 6 further declares that water *found on private lands* also belongs to the State. The owner of the land where the water is found may use the resource for domestic purposes without securing a permit. NWRB, however, may regulate such use when there is wastage or in times of emergencies. However, the NWRB has since required the registration of these water sources, as allowed by the Code.

The Code dramatically altered the concept of ownership of waters. Prior to the Water Code, the Civil Code (Section 503) recognized private ownership of certain categories of water (i.e., continuous or intermittent water rising on lands of private ownership; lakes and lagoons, and their beds, formed by nature on such lands; subterranean waters found on the same; etc.).

The appropriation of water (or the acquisition of rights over the use of water or the withdrawal or diversion of water from a natural source) is governed by the Water Code. Water may be appropriated for any of the following purposes:

- Domestic: the utilization of water for drinking, washing, bathing, cooking or other household needs, home gardens, and watering of lawns or domestic animals.
- Municipal: the utilization of water for supplying the water requirements of the community.
- Irrigation: the utilization of water for producing agricultural crops.
- Power generation; the utilization of water for producing electrical or mechanical power.
- Fisheries: the utilization of water for the propagation and culture of fish as a commercial enterprise.
- Livestock raising: the utilization of water for large herds or flocks of animals raised as a commercial enterprise.
- Industrial: the utilization of water in factories, industrial plants and mines, including the use of water as an ingredient of a finished product.
- Recreational: the utilization of water for swimming pools, bath houses, boating, water skiing, golf courses and other similar facilities in resorts and other places of recreation (Article 10).

Under the Code, no person can appropriate water without a water right. A water right is secured with a water permit issued by NWRB. The following may apply for a water permit:

- Citizens of the Philippines who are of legal age.
- Associations, duly registered cooperatives or corporations organized under the laws of the Philippines, at least 60 percent of the capital of which is owned by citizens of the Philippines.
- Government entities and “instrumentalities” including government-owned or controlled corporations.

The measure and limit of appropriation of water are its beneficial use. Beneficial use, as defined in the Code, is the utilization of water in the right amount during the period that water is needed for producing the benefits for which the water is appropriated. Standards of beneficial use are prescribed by NWRB to the appropriators of water for different purposes and conditions.

Local Government Code of 1991 (RA 7160)

While not specifically targeting water resources management, the Local Government Code of 1991 effected the decentralization and devolution of a broad range of functions and powers from the central to the local governments. The policy objective of the Code is the development of autonomous and self-reliant LGUs. The Code devolved various aspects of governance and the delivery of basic services, including health, food security and water. Under its implementing rules and regulations

(IRR), the LGUs are mandated to provide for the “construction and maintenance of infrastructure facilities funded by . . . the municipality . . . including artesian wells, spring development, rainwater collectors and water supply systems” (Sec. 25, Rule 5, IRR).

A key element in the Code is the provision of financial resources and the devolution of authority to the LGUs to undertake its expanded responsibilities:

- Paragraph (d), Section 3, Chapter 1: “(d) The vesting of duty, responsibility and accountability in local government units shall be accompanied with provisions for reasonably adequate resources . . . and an equitable share in the proceeds of the utilization and development of the national wealth within the respective areas.”
- Section 18, Chapter 1: “. . . Section 18 Power to Generate and Apply Resources: Local government units shall . . . have an equitable share in the proceeds from the utilization and development of the national wealth and resources within their respective territorial jurisdictions.”

The Code provides for a more responsive and accountable local government structure. Many of the current centrally provided basic services were devolved. LGUs now exercise more authority, responsibility and resources to accelerate the provision of basic services and facilities, including water supply, sanitation and sewerage. The Code mandates LGUs to be self-reliant in exercising their powers, duties and functions. It further states that for basic infrastructural projects funded externally or by national appropriation, the LGU may be designated as the implementing agency and must continue to enforce national policies, standards and guidelines. The Code also encourages private-sector participation in the public economic enterprises through sale, lease or other arrangements.

While many questions continue to be raised about the current capability and support systems of LGUs to deal with the services, the trend towards local responsibility and accountability is undeniably clear. This, along with the expanded allocation of Internal Revenue Allotments (IRA) to LGUs, strengthens the hand of local governments in water-resources development.

Executive Order 557: Creating the (Former) Rural Waterworks Development Corporation (1980)

This Order was the basis for the brief existence of the Rural Waterworks Development Corporation (RWDC). It was created to provide water-supply service to rural provincial areas not covered by LWUA or MWSS. Its mandate was to effect the delivery of water supply to small towns and remote *barangays* (villages) not reached by LWUA, through community-based Rural Waterworks and Sanitation Associations (RWSAs). An RWSA is a nonstock, nonprofit cooperative association organized under and/or registered with LWUA and “franchised” to operate a rural water system. These RWSAs are established in remote rural areas where access to water services is difficult to obtain or nonexistent. RWSAs operate Levels I and II systems. Level I service refers to point sources (such as rain catchments, wells and springs) for it is difficult to justify a full-scale distribution system. Level II service includes communal faucet systems designed for areas where houses are sufficiently dense to justify a simple piped distribution system with public faucets.

In 1997, the RWDC was abolished by Executive Order No. 124-A and its functions transferred to and assumed by the LWUA. EO 124-A also renamed and reorganized NWRC as the National Water Resources Board. It continued as an attached agency to the Department of Public Works and Highways (DPWH). However, all its technical functions (principally data collection, analyses and storage) were transferred to the Bureau of Research and Standards of DPWH.

Commentary

The actual origin of the RWDC program was rooted at the NWRC. One of the initial policies which NWRC followed was the initiation of programs where current government initiatives were inadequate. Rural water supply was one such area at that time. NWRC's rural water project was spun off as a regular program under RWDC whose creation helped NWRC focus on its primary mission of regulation and water-resources planning. In the beginning, RWDC was a fast-paced and well-funded "action" program. But the lack of serious attention to the institutional and financial aspects of its projects quickly took its toll and many of its systems fell into disrepair. The supervision of RWSAs was subsequently transferred to the LWUA. There is still no clear strategy on how these deteriorating RWSAs can be effectively assisted.

Republic Act No. 6234: Creating the Metropolitan Waterworks and Sewerage System (MWSS)

Republic Act (RA) No. 6234 is the charter of MWSS. In creating the agency, the law dissolved the old National Waterworks and Sewerage Authority (NAWASA). MWSS is responsible for providing water and sewerage service in an expanding Metropolitan Manila area. Its present coverage area consists of 37 cities and towns (Manila, Pasay, Quezon, Kalookan, Cavite, Makati, Mandaluyong, Muntinlupa, Marikina, Pasig and Las Pinas) and 26 municipalities (Malabon, Navotas, Paranaque, Pateros, San Juan, Taguig, Valenzuela in Metro Manila; Bacoor, Imus, Kawit, Noveleta, Rosario in Cavite province; and Antipolo, Cainta, Montalban, San Mateo, Taytay, Angono, Baras, Binangonan, Cardona, Jala-Jala, Morong, Pililla, Tanay, Teresa in Rizal province). The last nine towns in the above enumeration starting with Angono down to Teresa were included in the MWSS's coverage area by virtue of Batas Pambansa Blg. 799, in 1984. Therefore, its service territory covers 37 localities with most of them being urban centers of population.

Through this RA, MWSS exercises the following powers:

- To construct, maintain and operate dams, reservoirs, conduits, aqueducts, tunnels, purification plants, water mains, pipes, fire hydrants, pumping stations, machinery and other waterworks for the purpose of supplying water to the inhabitants of its territory, for domestic and other purposes; and to purify, regulate and control the use, as well as to prevent the wastage of water.
- To construct, maintain and operate such sanitary sewerage as may be necessary for the proper sanitation and other uses of the cities and towns comprising the system.
- To periodically fix water rates and sewerage service fees as the system may deem just and equitable in accordance with the standards outlined in Section 12 of this Act.
- To approve, regulate and supervise the establishment, O&M of waterworks and deep wells within its jurisdiction operated for commercial, industrial and governmental purposes and to fix just and equitable rates or fees that may be charged to customers thereof.
- To assist in the establishment, O&M of waterworks and sewerage systems within its jurisdiction under cooperative basis.

- To approve and regulate the establishment and construction of waterworks and sewerage systems in privately owned subdivisions within its jurisdiction.
- In the prosecution and maintenance of its projects and plants, the system shall adopt measures to prevent environmental pollution and enhance the conservation, development and maximum utilization of national resources, including the improvement and beautification of its reservoirs, filter plants, and other areas to promote tourism and related purposes, and shall provide for the necessary corporate funds thereof.”

Since its passage in 1971, RA 6234 has been amended several times. These revisions included the following:

- Presidential Decree (PD) No. 425 (March 1974) increasing its capital stock to P1.0 billion.
- PD 1345 (April 1978) authorizing MWSS, on request, to take over and administer the centralized water-supply systems in residential subdivisions within its territorial jurisdiction.
- PD 1406 (June 1978) increasing its capital stock to P3.0 billion; increasing total principal indebtedness but imposing ceiling on foreign loans.
- Executive Order (EO) No. 796 amending the composition of the Board of Trustees.
- Batas Pambansa (BP) Blg. 799 (April 1984) ceding to MWSS jurisdiction over the remaining towns of Rizal province.
- EO 1036 (June 1985) reorganizing the institutional structure of MWSS.
- EO 1063 (November 1985) increasing its capital stock to P8.0 billion.
- EO 197 (June 1987) increasing the membership in the Board of Trustees to nine members.

Provincial Water Utilities Act of 1973 (PD 198)

This Act declared a national policy of promoting local operation and control of drinking water supply systems in urban population centers outside Metropolitan Manila, and authorizes the formation of autonomous and independent local water districts to operate and administer water supply and wastewater management systems in their area. The Act also serves as the charter of the Local Water Utilities Administration (LWUA). The agency is responsible for the promotion, development and financing of water districts (WDs). Significantly, LWUA also acts as the regulatory body for WD tariff and operations. Its tariff regulation powers for water districts were recently transferred to the NWRB.

The Water District

In Section 5 of Title II, the Act defines the purposes for which water districts may be formed. Without limiting the extent of the operational scope of such districts, the act encouraged the formation of WDs for purposes of:

- Acquiring, installing, improving, maintaining and operating water supply and distribution systems for domestic, industrial, municipal and agricultural uses for residents and lands within the boundaries of such districts.
- Providing, maintaining and operating wastewater collection, treatment and disposal facilities.
- Conducting such other functions and operations incidental to water-resources development, utilization and disposal within such districts.

A WD is formed at the option of local officials and the residents. It begins with the approval of a local ordinance (a council resolution) by the municipal council to a) form the WD, and b) transfer any and all waterworks and/or sewerage facilities presently owned or controlled by the municipality or city, to the WD. The WD is considered established upon the filing with LWUA of this resolution. “Sec. 7. Filing of Resolution: The district shall be deemed duly formed and existing upon the date of such filing. Upon such filing, the local government or governments concerned shall lose ownership, supervision and control or any right whatsoever over the district except as provided herein.” LWUA issues a Conditional Certificate of Conformance to document the filing and acceptance that the WD has met an initial set of legal requirements for its formation. WDs enjoy a wide range of powers, rights and privileges. It can:

- Purchase, construct or acquire works, water rights, land, rights and privileges useful or necessary to convey, supply, store, collect, treat, dispose of or make use of water for any purpose.
- Sell water to any person with the district.
- Restore, construct, operate and furnish facilities and services for collection, treatment and disposal of sewerage, waste and storm water.
- Exercise its right of way to locate, construct and maintain works on any land, which is now, or hereafter, owned by the government or by any of its political subdivisions.
- Borrow money and issue bonds, promissory notes and other evidence of indebtedness to support such borrowings. These obligations may be secured by property of the WD. The interest on the bonds and notes is exempt from taxes.
- Sell water under its control under a tariff structure determined by its board of directors.
- Make use of its power of eminent domain.
- Fix, levy and collect a sewerage and wastewater service standby or availability charge in the event the sewer service is available and no connection is made.
- Adopt and levy a groundwater production assessment on commercial or industrial areas in the event their production is injuring or reducing the district’s financial condition.

Among a WD's privileges are:

- Exemption from income taxes, except taxes on interest income from deposits and on investments that are not related to water-services operation.
- Exemption from franchise taxes and realty taxes on all lands and other real property devoted to water-supply generation and distribution.
- Exemption from all duties or imposts on imported machinery and equipment and materials not manufactured locally.
- Exemption from the payment of all national and local governments and municipal taxes and fees, including any franchise, filing, recordation, license or permit fees, charges or costs involved in any court or administrative proceedings to which it may be a party.
- Exclusive franchise to carry on the function and power of providing water-supply services for domestic, industrial or commercial uses within its territory.

The legal status of WDs is as follows: A water district is a quasi-public corporation performing a function of a public agency. Legally, a quasi-public corporation is a private corporation that has accepted from the State the grant of a franchise or contract involving the performance of public duties (1 Fletcher 216). It is a private corporation that renders public service or supplies public wants (7 R.C.L. 42; Cooley, Municipal Corporations). The term "quasi-public" loosely translates into "as if public," meaning that inherently the corporation has a private character but it appears like a public agency in view of the kind and nature of the services it performs. This was the collective position taken by the water districts early in their operation. In 1991, however, the Supreme Court ruled in the case of Davao Water District vs. Civil Service Commission (G.R. No. 95237-38) that water districts are government-owned or controlled corporations. The Supreme Court interpreted PD 198 as a special law constituting the charter of water districts. Corporations with original charters are not private corporations, which are strictly organized and established under the provisions of the Corporation Code of the Philippines (BP Big. 68). Hence, water districts cannot be considered as private corporations under the Corporation Code.

The Local Water Utilities Administration

PD 198 (in Title III) also established the Local Water Utilities Administration (LWUA). LWUA is primarily a specialized lending institution for the promotion, development and financing of local water utilities. It is the agency on the national level designed to minister to the needs of provincial local water utilities. LWUA's immediate but continuing program involves the following:

- The establishment of a uniform standard for the administration and management of water districts.
- The development of minimum performance and quality standards for local water utilities and conformance monitoring of those standards.

- Furnishing of technical assistance and technical training to local water utilities.
- Lending to qualified local water utilities.
- Directing systems integration, district annexation and deannexation.

LWUA is authorized to borrow funds from both domestic and foreign sources. In addition, LWUA is authorized to issue bonds, debentures or other evidence of indebtedness constituting a lien on all securities, covenants and obligations of local water utilities for loans made to such water utilities.

Regulation of Water Districts

Operations regulation. LWUA exercises powers to regulate the operations of all WDs. These standards are set by LWUA in coordination with other government agencies active in the areas of public works, health and sanitation. These standards include the following:

- *Water quality.* Minimum drinking water standards including a uniform testing and reporting system. Water quality standards shall include bacteriological, chemical and physical parameters.
- *Design and construction.* Minimum criteria for the design and construction of new or additional facilities for water supply, treatment, transmission and distribution, and for wastewater collection, treatment and disposal.
- *Equipment, materials and supplies.* Standards for the optimum selection and effective utilization of equipment, materials and supplies by local water and sewer utilities.
- *O&M.* Standardized procedures for operating and maintaining equipment and facilities.
- *Personnel.* A majority of WD staff who operate or manage local water utilities must have satisfactorily completed appropriate training courses, programs or seminars or are holders of certificates of competence.
- *Organization.* Organizational and institutional criteria to assure independent operation and financing of the WD.
- *Accounting.* The WD should adopt a prescribed accounting system with uniform charts of accounts. A comprehensive Commercial Practices System, which includes the accounting system and internal management reporting, is implemented.

The certificate of conformance treated under Personnel above is a form of credentials-building and compliance-verification program to determine whether the local water utility has adopted the requisite procedures and practices and therefore deserves to receive a stamp of approval for issuance of the said certificate. The certificate of conformance entitles the utility to obtain financial assistance (in the form of a loan) from LWUA.

Tariff regulation. The rate review power of LWUA provides a mechanism to ensure that the rates proposed by water districts are adequate, just and equitable. They should be sufficient to provide for:

- Reimbursement from all new water customers for the cost of installing new services and meters.
- Revenue from all water deliveries and services performed by the water district.
- Annual operating expense of the water district.
- The maintenance and repair of the works.
- A reasonable surplus for replacement, extension and improvement.
- The payment of the loans of the district and a sinking fund for other debts of the water district.

The power of LWUA to regulate water rates covers only publicly owned water districts. Other water utilities such as the ones in private subdivisions or those run by LGUs do not fall within the ambit of the rate review influence of LWUA.

In the same vein, such rates should be equitable. They should be just, fair and reasonable. The rate mix should be such that the cost of the service is apportioned among different levels of users. The ideal result would be that the less-privileged pays less than those who are economically leveraged. In addition, there is an Executive Order which limits increases to no more than 60 percent of the previous rate.

Commentary

LWUA is effectively stymied from proceeding in areas which do not meet the viability test (based on current lending terms and tariff adjustment policies). There are about 175 nonoperating WDs. These include municipalities with a population size ranging from 20,000 to 50,000. Similarly, a strategy for supporting RWSAs is nonexistent. LWUA is also hard put to lay out an improvement program for these areas given current policy requirements. Sectorally, there are no incentives to focus support for the “nonviables.”

LWUA is a specialized lending institution mandated to promote and oversee the development of provincial water districts (WDs) based on financial viability of projects. Most water utilities were under the LGUs until 1973, when some LGUs opted to waive their control over the utility and organize WDs to qualify under the LWUA program. In 1987, LWUA responsibilities were expanded to include assistance to Level II Rural Waterworks and Sanitation Associations (RWSAs). The provision of Levels II and III services and of wastewater disposal systems in communities outside metropolitan Manila are largely coordinated through the LWUA. WDs currently serve about 18.43 M consumers in about 703 cities and municipalities. The National Economic Development Authority (NEDA) Resolution No. 4 directs LWUA to focus on its development banking role and to finance only viable WDs. Since 1972, 544 WDs have been formed and 486 WDs have availed of loans totaling P 4.0 billion. It has completed over 880 water-supply projects. LWUA has also

developed a wide array of institutional development, financial and technical support services for WD and RWSA development.

The very origin of LWUA and the WDs was based, among others, on a strategy to wean water-supply provision away from detrimental political factors. Another factor is the inability of the public sector to sustain effective O&M programs. Government bureaucracy tends to be stymied by procedures and does not have a real appreciation for “marketing of services” or a commercial orientation. After more that 25 years of generally successful experiences, the following issues have become evident.

- Lack of incentives for WDs to increase service coverage beyond the core areas poblacion (or areas which are profitable).
- Service expansion based on financial viability criteria tend to lead to technical problems with the systems (undersizing of pipes, etc.).
- Current LWUA project criteria tend to favor middle- to high-income classes. Attempts to focus on low-income residents have tended to be labeled as unwarranted political intervention (devoid of any understanding of the PD198 viability mandates). This LWUA dilemma has persisted for many years. Should it ignore its mandate (i.e., viable water systems) and provide technical assistance and funding channels for grants and loans to nonviable and/or low-income communities?
- The LWUA dilemma is that while it is clear that viability is a prime concern (as affirmed by NEDA), the reality is that it continues to be expected and is judged on the basis of its ability to deliver its services regardless of the viability criteria.

The Build-Operate-Transfer (BOT) Law (RA 7718)

The BOT recognizes the importance of the private sector in economic development and provides the framework and incentives to mobilize private resources for financing the construction, O&M of infrastructure and development projects. These incentives include financial incentives (tax relief or exemptions, limited guarantees, etc.); relaxation of some government regulations; clearer and systematic procedures and firm government undertakings in support of the private sector. Almost all forms of development projects, most of which affect water resources, may be implemented under the BOT scheme. The law lists the following types of supported projects, which may potentially have a key water-resources impact: canals, dams, hydropower, water supply, irrigation, sewerage, drainage, dredging reclamation project, industrial estates or townships, government buildings, tourism, slaughterhouses, warehouses, public markets, solid waste management, health facilities and other infrastructural and development projects as may be authorized by the appropriate agency.

This law allows the following contractual arrangements:

- Build-operate-and-transfer (BOT)
- Build-and-transfer (BT)
- Build-own-and-operate (BOO)

- Build-lease-and-transfer (BLT)
- Build-transfer-and-operate (BTO)
- Contract-add-and-operate (CTO)
- Develop-operate-and-transfer (DOT)
- Rehabilitate-operate-and-transfer (ROT)
- Rehabilitate-own-and-operate (ROO)

There is a provision allowing contractual arrangements not falling under any of the above, provided these are approved by the President of the Philippines. In any of these contractual undertakings, the government may not provide direct guarantees, meaning the government has no obligation to assume responsibility for the loans incurred by the proponent in the event of the latter's default. But some undertakings are authorized such as cost-sharing up to 50 percent of total project cost to be financed from direct budgetary outlay for the project or official development assistance, and the provision of support facilities like access roads.

In the case of public utilities, a franchise to operate is automatically issued to the winning bidder. While a franchise is normally granted through administrative or legislative means, this feature in the law effectively translates that the issuance of the franchise is delegated to the implementing agency. If the government terminates the contract, either unilaterally or by mutual agreement of the parties or by the proponent (in case the government default), the proponent will be reimbursed for actual expenses on the project and an additional sum as a reasonable rate of return.

Capacity Building and Recent Technical Assistance Projects on Water Resources Management

Various technical and institutional policy studies involving the sector were implemented during the 1990s. The results of these projects have helped define the future direction for reforms in the sector and reinforced the acceptance of IWRM. These projects included:

The Philippine Water-Supply Sector Reform Study, 1993

This study was financed under the provisions of the Japanese Grant Agreement in cooperation with the World Bank. The study identified policy implementation options for sectoral reform toward improving the absorptive capacity, sustainability of implementation and operation of the water-supply sector, and improvement of its institutional and legal arrangements.

The Philippines: Action Plan for Reforms Related to the NWRB, 1995

This study diagnosed the water-resources-management practices in the country. The action plan it submitted recommended various options for strengthening the NWRB. It also recommended an action plan and timetable for attaining its recommendation.

Philippines: Regulatory Issues for Water-Supply and Sewerage Sector Privatization, January 1996

This project studied the regulatory framework for the water-supply and sanitation sector with a view toward promoting private-sector participation. It assessed the incentives and constraints, in general, and those posed specifically by the regulatory arrangements. It scrutinized the regulatory issues involved to attract private capital into the sector. It forwarded recommendations on the appropriate regulatory arrangement in the context of increased private investment and participation in more water-supply and sewerage utilities in the future.

The Philippine Water Sector: A Policy Advice Note for the World Bank, February 1996

This study recommended a set of principles for reforming the institutional arrangements for economic regulation of the water sector. It presented a recommendation, based on a single regulatory body and an alternative plan for two regulatory bodies, one for economic regulation and the other for regulating water use and extraction.

Significantly, this note differentiates between the regulatory arrangements for tariff for water use (as imposed by water utilities) and economic pricing of water resources. It recommended steps towards the adoption of economic pricing systems.

National Strategy and Action Plan for the Water Supply and Sanitation Sector

A national study of the Philippine Water-Supply and Sanitation Sector was completed with the guidance of NEDA and the Department of Finance through Technical Assistance from the Asian Development Bank. Although specifically targeting the water supply and sanitation subsector, the National Strategy and Action Plan recommended a range of strategies in six broad areas with implications on the broader water-resources-management arrangement, namely:

- Coordinated planning and policy formulation within the sector.
- Charging an economic price for raw water.
- Comprehensive regulation and effective enforcement of laws, rules and regulations.
- Better sector-development planning.
- Encouragement of private-sector participation.
- Improving finances for the sector by the use of market mechanisms.

Water-Resources Development Project (WRDP)

WRDP was designed based on the decision reached during the December 1994 National Water Summit in Manila that there was a need for further integration and coordination of all water-related efforts towards a more focused approach to water-resources management. The project would develop an appropriate policy and institutional framework to improve water-resources planning, development and management in the country; initiate an integrated and comprehensive approach to watershed

management to sustain water sources; and improve efficiency of existing irrigation systems thereby increasing agricultural production. The project would also improve irrigation services in the long term by accelerating management turnover of irrigation systems to water users and by increasing NIA's institutional effectiveness.

The Water Resources Development project assists the government in developing an appropriate policy and institutional framework to:

- Improve the water resources planning, development and management process.
- Initiate an integrated and comprehensive approach to watershed management for sustainable water sources.
- Improve existing irrigation system efficiency, thereby increasing agricultural production, and alleviating rural poverty.
- Improve irrigation services in the long term by accelerating management turnover of irrigation systems to water users and by increasing NIA's institutional effectiveness.
- Improve the environment in irrigated areas.

The WRDP addresses sector problems by assisting the Philippines government in developing a coherent strategy and policy framework to improve water-resources development, planning and management, including watershed management and protection. The project will also repair and improve the efficiency of existing irrigation systems, provide institutional strengthening to the irrigation agency and water user groups, and improve the environment in irrigated areas. By improving irrigation systems, which are the biggest users of water in the country, overall water-resources management will benefit, agricultural production will increase and poverty alleviation efforts will be boosted.

The Bank loan of US\$58 M finances 68 percent of the estimated total project cost of US\$85.2 M; the Danish International Development Agency has committed US\$1.2 M for the watershed management study, and the remainder will be financed by the Philippines government. The project started in 1997 by NIA as the lead agency, the National Water Resources Board (NWRB), the Department of Environment and Natural Resources (DENR) and the Department of Health (DOH).

Economic Pricing of Raw Water

Acknowledging the interdependence of water to national development, the government has developed policies intended to implement efficient utilization and equitable allocation of water resources to balance the diverse demands of competing uses. The introduction of economic pricing is a key element in establishing the enabling environment for IWRM. Through the Water Code, the NWRB has been authorized to levy fees or charges from water appropriators. The declared policy objectives of raw water pricing are that raw water should be priced according to economic principles to promote incentives to conserve a scarce resource, to provide a basis for efficient allocation and to provide a source of revenue for more effective water-resources development. In addition to these objectives, the pricing of raw water can also deliver significant health and social policy objectives.

The Medium-Term Philippine Development Plan 2001-2004 calls for the development of “a pricing mechanism that takes into consideration cost recovery and externalities while balancing the same with the public’s capacity and willingness to pay.” Careful assessment of capacity and willingness to pay by the different water users has to be undertaken. NEDA has noted that the current approach to the pricing of raw water leads to wasteful and inefficient use of the resource. The fees charged by NWRB do not appear to have any economic basis and are insufficient to provide for the cost recovery for water-resources management.

The costs to manage water resources include various components such as the costs to NWRB for effective administration and enforcement of water rights; assessing and collecting raw water fees; and effective data collection and management. NEDA noted that water has opportunity costs as well. To reflect these costs, water rights can be transferred between users either temporarily or permanently with compensation, so that water can move to a higher value. NEDA has also recommended that volumetric pricing for irrigation water should be adopted so that a definable commodity for possible transfer to higher-value use can be made. However, NEDA also noted that this shift to volumetric pricing should be based on cost recovery and consider farmers’ capacity to pay and should not impair the farmers’ incentive to avail of irrigation services.

In addition, many countries currently subsidize the agricultural sector by charging uneconomic rates for water use. Improvements in both water use efficiency and financial efficiency are badly needed; however, the impact of increases in water charges needs to be carefully assessed.

Organizing Appropriate Institutional Roles for IWRM Implementation

Although the Water Code of the Philippines has been generally hailed globally as a model for other countries in a similar stage of development, there are perceived some established inadequacies in its implementation, enforcement and monitoring. To begin with, there are numerous agencies and departments of government dealing with water resources concerns. In most instances, each agency or department has its own interests, capabilities and resources. Each is responsible for one or a number of specific aspects of water-resources activity in a given subsector. This is now further complicated by the increasing role of local government units.

This section on governing and institutional roles looks into the delineation of responsibilities among institutions and authorities involved in water-resources management, the separation of regulation from service-provision functions, the adequacy of coordinating mechanisms, filling jurisdictional gaps and eliminating overlaps and matching responsibilities to authority and to capacities for action, all of which are part of institutional development.

Overview of the Key Institutions

Central-Level Institutions

The National Economic Development Authority (NEDA) ensures that all agency programs are consistent with national priorities in the Medium-Term Public Investment Program and the Priority Subsector Activity Layout. External grants and loan proposals are reviewed and approved at NEDA through its Investment Coordinating Council (ICC).

The National Water Resources Board (NWRB) coordinates the overall policy framework for water resources development and management. NWRB was created to guide an orderly and scientific development of all water resources consistent with the principles of optimum utilization, conservation and protection to meet present and future needs. NWRB also deals with water-rights issues.

The Department of Finance (DOF) is responsible for the generation and management of the financial resources of the government. It reviews and approves all public sector debt; oversees the fiscal soundness of public investments and sets the fiscal deficit targets of government corporations, as part of the public-sector borrowing program.

The Department of Budget and Management (DBM) plans the budget allocations for the government agencies, including capital and operating expenditures, equity infusion to public corporations, and grants and subsidies for legislative approval. DBM also ensures that budget releases conform to approved plans and programs.

The Department of Environment and Natural Resources (DENR) formulates and enforces policies and guidelines for environmental protection and pollution control. It is responsible for watershed protection and water-quality management. It checks compliance of major projects with environmental guidelines. DENR works with all environmental management agencies and special regulatory bodies.

On November 5, 2001, DENR institutionalized the integrated approach in water-resources management in its programs and projects through DENR Administrative Order No. 29-2001. The Directorate on Integrated Water Resources Management shall be the implementing office of this directive and shall perform as the apex body to oversee and coordinate all water-related issues within the DENR. It has been the policy of DENR to attain and maintain a balance between socioeconomic growth and environmental protection through the renewal and conservation of the country's natural resources. The Directorate is intended to streamline and integrate all programs within DENR related to both surface water and groundwater resources. It is principally tasked to harmonize and institute measures towards promoting greater fiscal discipline through holistic management and prudent national spending as well as accountability for use of DENR's resources in the water sector. The Directorate aims to:

- Act as the prime mover for national unity and alliance in the water sector.
- Show and promote the sincerity of DENR in ensuring the protection and conservation of water resources.
- Allow surveillance, monitoring and evaluation of water users within the context of the Philippine Water Code.
- Encourage strict regulation of water use and ensure that public interests are protected in the provision of safe drinking water, sanitation, irrigation, and other water services by service providers.
- Ensure the rehabilitation of river basins, watersheds, waterways, esteros and other freshwater and saltwater ecosystems for sustainable developments.
- Advocate strong partnership and participation of the private sector and civil society in all levels of water-resources management, development and utilization.

- Promote and encourage the use of renewable water using appropriate and environmentally sound techniques and technologies.

DAO 2001-29 rationalizes existing data-collection activities currently undertaken by the DENR Central Office, its bureaus and attached agencies. Among the salient features of DAO 2001-29 are the following:

- Formulation of a Water Resources Information Network.
- Publication of an Annual Water Resources Environment.
- Formulation of a Water Resources Development and Management Framework.
- Formulation of a Logical Framework and Strategic Action Program.
- Implementation of a Capacity Building Strategy.
- Sectoral complementation and formation of a Special Water Action Team and Regional Water Management Units.
- Formation and accreditation of a Tubig (Water) Patrol Group and Water Surveillance Volunteers.

The country is divided into various provinces, cities, towns and municipalities. One of the prime mandates of the Department of the Interior and Local Government (DILG) is to strengthen local capacity for delivery of basic services, including water and sanitation. It is responsible for providing general administration and institution-building support to LGUs, including assistance in the formation and training of BWSAs; coordination of preparing a master plan; sourcing of external funds; formulation and installation of sector-management systems, including O&M and BWSA financial-management systems. Ultimately, DILG will be geared to provide a range of support services to develop the capability of LGUs to provide, manage, operate and maintain water-supply projects either directly or with community-based organizations, like BWSAs. The Project Management Office (PMO) for Water Supply and Sanitation is established under the Assistant Secretary for Plans and Programs. Its goal is to enhance the LGU's capability in the organization and development of sustainable community organizations to manage, operate and maintain water supply, sewerage and sanitation facilities.

The Department of Public Works and Highways (DPWH) is responsible for flood control and drainage management; the construction and major rehabilitation of rural water-supply systems (level 1) and for the planning and execution of sewerage projects in some cities and larger poblaciones in the country with participation of LGUs. The PMO for Rural Water Supply was established in 1981 to "manage and direct the planning, design, construction, organization and maintenance of foreign-assisted rural water supply projects. At the field level, DPWH District Engineering Offices (DEOs) undertake the implementation and rehabilitation of water-supply projects in the province. Its basic functions include the identification of well sites, drilling operations, equipment maintenance and monitoring of implemented water-supply projects. There are about 92 DEOs most of which are staffed with a water engineer, drilling crews and equipment. Some DEOs also oversee BWSA formation and training activities.

The Department of Agriculture is the main government agency responsible for the promotion of agricultural development growth. It establishes the policy framework, helps direct public investments, and in partnership with local government units (LGUs), provides the support services necessary to make agriculture and agri-based enterprises profitable and to help spread the benefits of development to the poor, particularly those in rural areas. The Bureau of Soils and Water Management (BSWM), under the Department, is mandated to render technical assistance on the utilization and management of soils and water as vital agricultural resources. Significantly, the Department's National Artificial Rain Stimulation Office (NARSO) is the government agency tasked with cloud-seeding operations to alleviate the impact of prolonged drought and minimize their effects.

The Department of Health (DOH) is the principal health policymaking and implementing agency. It develops and implements national sanitation programs and administers health education aimed at reducing morbidity due, among others, to waterborne and sanitation-related illnesses. Its Environmental Health Service undertakes water-quality surveillance to ensure the safety of safe water supplies.

The Department of Energy (DOE) and the National Power Corporation (NPC) are responsible for, among others, hydropower development.

The Department of Education, Culture and Sports (DECS) implements hygiene education programs through schools using the Teacher-Child-Parent (TCP) approach. Health and sanitation messages are integrated in the curricula and special activities are designed to make the parents and other family members learn and put them into practice.

In addition, there are numerous government corporations and special bodies that are responsible for planning and implementation of specific water-related programs, among which are the following:

- The Local Water Utilities Administration (LWUA) is responsible for the promotion, development and financing of local provincial and municipal water utilities.
- The Metropolitan Waterworks and Sewerage System (MWSS) is responsible for water supply, sewerage and sanitation in Metro Manila and partially in its neighboring provinces.
- NIA promotes irrigation development and provides extension services on improved irrigation methods.

In addition to these agencies, there are two functional river-basin organizations, the Laguna Lake Development Authority (LLDA) and the Agno River Basin Development Commission (ARBDC). This is discussed in more detail in the succeeding sections.

Various proposals have been put before the Philippine Congress for consideration including the Water Regulatory Commission (WRC), the National Water Resources Commission and the Water Resources Authority of the Philippines (WRAP), and various water-related bills.

Local-Level Institutions

At the local level, the main function of the Local Development Council (Provincial Development Council) is to formulate long-term, medium-term and annual socioeconomic development plans and

to coordinate, monitor and evaluate the implementation of development programs and projects. The PDC is headed by the Governor and is composed of all mayors of component municipalities, chairman of the committee on appropriation of the Sangguniang Panlalawigan, the Congressman and representatives of NGOs operating in the province.

The Provincial Planning and Development Office (PPDO) is the nerve center of all provincial planning activities. The PPDO conducts research and studies necessary to support plan formulation. It likewise integrates and coordinates sectoral plans and studies done by the different agencies and monitors and evaluates the implementation of development programs and projects. It serves as the secretariat to various local bodies like the Provincial Health Board, Provincial School Board and Provincial Development Council. As a matter of policy, the recipient barangays are requested to put up a counterpart either in cash, materials or labor. Evaluation of the sector projects to be implemented is done by PPDO also in coordination with PEO and PHO. The Provincial Engineer's Office (PEO) primarily takes charge of the construction, maintenance, improvement and repair of provincial public-works projects. It provides engineering services like investigation and survey, engineering designs, feasibility studies and project management. It exercises technical supervision of all engineering offices of the component municipalities. The Provincial Health Office (PHO) administers and guides efficient and effective implementation of health-related services, programs and activities. The Rural Health Units and Barangay Health Stations are under the supervision of the Provincial and Municipal Health Offices.

The Municipal (or City) Planning and Development Office is mandated to monitor and evaluate the implementation of different development programs and activities in the municipality. It is also tasked to prepare municipal development plans and to formulate an integrated economic, social and physical development plan. The regular activities of MPDOs include: preparation of the Municipal Comprehensive Plans and other planning documents; assessment, monitoring and evaluation of different projects of the municipal government; and assistance in the integration and coordination of all sectoral plans. The Municipal Engineer's Office is responsible for the administration, coordination, supervision of all construction, and repair and maintenance of public works projects in the municipality. It initiates, reviews and recommends innovations in policies and objectives, plans, programs, techniques, procedures and practices in infrastructural development, including zoning policies in the municipality. The MEO performs engineering surveys to gather data for designs, layout or construction of waterworks system, sanitation facilities, and other infrastructure projects. It also inspects works of contractors based on plans and specifications.

Barangay Councils provide, among others, for the maintenance of barangay facilities related to general hygiene and sanitation and solid waste collection. It also submits recommendations to higher legislative bodies to improve the general barangay health and social welfare services.

River-Basin-Focused Planning and Management

Institutional Models

The current Medium-Term Development Plan declares that the river-basin management approaches will be pursued and strengthened. Currently, there are only two basin organizations, the Laguna

Lake Development Authority and the Agno River Basin Development Commission. The latter was created only in 1997. There have been other attempts to introduce regional and/or river-basin planning institutional models. However, these special regional and basin agencies were subsequently dissolved and sectoral agencies were assigned to continue their programs and projects. Recent developments on these two entities point out interesting features in national efforts to integrate the river-basin management approach into the national development process, particularly into its complex legal and institutional framework. As may be surmised from the features presented below, future achievements on this subject depend mainly on whether the government will decentralize authority or fully commit itself to river-basin management for which strong leadership and community participation are required.

Various lessons can be drawn about the effectiveness of institutional models and their processes. Several models have evolved or have been tried in the past, including:

- A centrally mandated quasi-government structure with both regulatory and developmental functions. Case 1: Laguna Lake Development Authority.
- Local Government Unit-led initiatives. Case 2: The Upper Pampanga River Basin Coordinating Council.
- Project-led arrangements. Case 3: Bicol River Basin Development Council.
- Government-department-led arrangements. Case 4: Agno River Basin Development Project.

Case 1. Laguna Lake Development Authority

The development of the Laguna Lake Development Authority (LLDA) presents a clear viable model on how the institutional arrangements using IWRM may look like. The LLDA was created by Republic Act 4850 in 1966 as a quasi-government agency with regulatory and proprietary functions to lead, promote and accelerate the development and balanced growth of the Laguna lake following national and regional plans and policies for social and economic development. Subsequently, through Presidential Decree 813 in 1975 and Executive Order 927 in 1983, its powers and functions were further widened to include environmental protection and jurisdiction over surface waters of the lake basin. LLDA was poised to carry out the development of the basin with utmost regard for environmental management and control; the preservation of the quality of human life and ecological systems; and the prevention of undue ecological disturbances, deterioration and pollution. In 1993, the administrative supervision over LLDA was transferred to the Department of Environment and Natural Resources through Executive Order 149. Recent laws have amended and expanded the mandate of LLDA and yet its organizational capacity has remained unchanged over recent years. Institutional transformation is now taking shape providing a bigger role for participation of stakeholders and development partners in the private sector.

LLDA was established to promote the sustainable development and maintain the ecological integrity of the Laguna Lake basin, which is the largest inland body of water in the Philippines and the second largest freshwater lake in Southeast Asia. The lake is used for fishery, navigation and transport, as a reservoir for floodwater and a waste sink, and for power generation and irrigation.

By far the most important use of the potential of the lake is as a major source of freshwater for domestic and industrial purposes for Metro Manila and surrounding areas in years to come. Faced with increased competition and conflicting water uses, the LLDA needed a comprehensive approach to water-resources management and development of the Laguna lake. The lack of understanding of the system functioning, the demand and supply of water resources, and the inadequacy of information needed to have a coherent understanding of water-resources management and development threatened not only the sustainability of the lake uses but also the ecological functions of the lake.

LLDA was given regulatory powers such as exclusive authority to grant permits for the use of lake waters and clearance for all development activities within the region. LLDA has since:

- Formulated the Laguna de Bay Master Plan, which provides the vision for the development of the region and describes the strategy and programs of action to realize that vision.
- Declared a multiuse policy. For the dominant use of the lake, this means a refocusing of priorities from the promotion of fisheries to environmental protection, watershed management and pollution control.
- Implemented an Environment User Fee System, which is a market-based instrument designed to motivate industries to comply with all environmental standards by setting stiff disincentives for noncomplying industries and attractive incentives for complying industries.
- Intensified efforts to stop the degradation of the 21 river systems which drain into the lake. Using the basin or watershed approach to resources management, the revitalized river-rehabilitation program encourages multi-sectoral involvement in the effort to save the rivers and ultimately the lake from further environmental degradation.
- Commissioned various institutions to undertake important studies and projects to further upgrade its own capacity to manage the lake and its watershed in a sustainable manner.

Laguna De Bay Basin

Physical Features of the Lake and the Basin Area

Laguna Lake is trilobate with the West Bay, Central Bay and East Bay that converge towards the south. The West and Central Bays are separated by Talim Island, the largest and most populated of the nine islands within the lake. It is bordered by the rugged, high Sierra Madre mountain ranges on the northeast, the Caliraya volcanic plateau in the east and the chain of mountains of Laguna and Batangas province to the south and southeast, including Mt. Banahaw and Mt. Makiling that feed the Mak-Ban Geothermal energy plant. Many of the tropical forests that once surrounded the lake have been converted to other uses, thus contributing to the accelerated siltation. The basin area is defined in Section 2, E.O. 927 (1983) and currently consists of 52 towns and 8 cities located in 5 provinces and Metropolitan Manila. Twenty-eight (28) towns are directly located along the lakeshore.

Heavy siltation has reduced its present depth to an average of about 2.5 meters. The basin area is about 3,730 km² and the lake holds an average of 2.9 billion cubic meters of water but may swell to the brim when it absorbs waters diverted from the Marikina river through the Mangahan floodway to spare the Manila metropolis from flooding. The swollen lake waters are drained to the

Manila Bay through the Napindan channel that connects with the Pasig river. The main physical features of the lake are outlined below:

Average depth	About 2.5 to 2.8 m
Greatest depth	About 20 m (Diablo Pass)
Average volume	2,250 million m ³ (2.25 x 10 ⁹ in ³)
Watershed area	283,000 hectares
Human population in the watershed	About 10 million
Shoreline	238 km
Number of river tributaries	21
Retention time	About 7 months
Outlet of the lake	Pasig river through the Napindan channel
Biological resources	Fish, mollusks, plankton, macrophytes

The water quality of the lake has been monitored monthly since the early 1970s in five lake stations. Annual averages from 1990 to 2000 show that Biochemical Oxygen Demand (BOD), dissolved oxygen, nitrate, pH, and total coliform meet the DENR criteria for Class “C” waters. The quality of the lake water should be maintained at this level to be suitable for fisheries. LLDA also conducts Lake Primary Productivity Measurement at four lake stations that provide basic information on turbidity and availability of natural food (algae) for fish production. The water quality of the Laguna lake has been improving since 1995.

The LLDA in Transition

Following the central policy of sustainable development, the LLDA implemented a restructuring and strengthening program to transform and strengthen its role as a watershed management institution to undertake the challenging task of managing Laguna lake and its watershed using an integrated and comprehensive approach. This “reengineering” program will restructure LLDA’s function, deepen its mandate and fine-tune and enhance its regulatory and economic instruments. The reengineering of LLDA is guided by strategic objectives meant to strengthen its foundation:

- *Ecosystem-based planning and management* of the lake resources that are sustainably balanced with economic vitality and social well-being of a wide spectrum of stakeholders.
- *Participatory and partnership approach in planning and implementation* that recognizes the shared stewardship of the lake by the government, civil society, business enterprises and the local community.
- *Broadened use of market-based instruments* that induce participation and partnerships through economically sound resource-use fees and charges.
- *Restoration of water quality* of the lake to a sustainable standard that satisfies the competing demands of lake water use.
- *Developing and sharing knowledge* with a wide range of stakeholders in order to develop competence and capability in comanagement of the lake resources.

Economic Uses of the Lake

Existing and potential lake uses have been identified for sustainable use and multi-stakeholder objectives. LLDA pursues a multiuse policy for Laguna de Bay water resources. Various lake users coexist and are supplemental and complementary to each other. The LLDA's policy is to promote dialogue, discussions and negotiations among the users in settling disputes and resolving issues. With a multiple-use policy in the development and utilization of the lake-water resources, mutually beneficial coexistence and cooperation are required among the various lake stakeholders. A multi-sectoral and multiagency approach is needed to harness the resources and capabilities of the various lake stakeholders in actively participating in resources management and conservation.

Fisheries. At present, the lake's most dominant use is fisheries. It is estimated that the lake yielded 37,000 to 47,000 MT (metric tons) of fish from 1997 to 2000 from both fishpen operations and open fisheries. Crustaceans and mollusks declined in yield from 1,927 to 574 MT and from 101,101 to 85,363 MT, respectively, during the same period. With the introduction of fishpen culture technology in 1970, the rise in lake fishery production also led to some social conflicts. Large-scale fishpen culture has threatened the economic conditions of fishermen dependent on open water catch. A revised Lake Fishery Zoning and Management Plan was implemented in 1996.

Transportation. The LLDA has laid out navigational routes for lake travelers and users to avoid conflicts with fish cultivators, fishpen owners, and free-range fishermen. More than 5,000 motorized and nonmotorized watercraft operate on the lake as a form of transport for lakeshore communities. In addition, around 23 barges ply the lake daily to transport an estimated 75,640 barrels of oil and oil products to various supply depots.

Power generation. Four power plants are located in the region. A pump storage hydroelectric power station is operated in Kalayaan, Laguna. Water is pumped up to the Caliraya reservoir to generate about 300 megawatts of electricity. Efforts are underway to increase this capacity to 600 megawatts. Two power plants (KEPHILCO-Malaya and National Power Corporation-Sucat) use the water from the lake for cooling. The Mak-Ban geothermal power project is within the lake watershed.

Recreation. Another use of the lake is for recreational activities of lakeshore residents and tourists. Although classified only for noncontact recreation, such as fishing, boating and sailing, the lake is used for swimming by some communities. There are plans in the private-sector drawing boards for more freshwater recreation and sports. Lakeshore resorts near Mt. Makiling extract hot spring waters for a health spa and beauty treatment. Plans for the promotion of ecotourism are coming to fruition.

Domestic water supply. With a rapidly increasing regional population coupled by inadequate surface-water production in the Angat region and the generally declining groundwater resources, lake water is now seen as the major source of potable water supply. The lake water has high potentials as an alternative source of domestic water supply for the nearby lakeshore towns and the adjacent metropolis. State-of-the-art models have been established to examine the physical, chemical and biological behavior of the Laguna lake. These models will be used in planning activities for any proposed infrastructural works for the lake-basin region. An environmental study for dredging the heavily silted lake is underway to establish the feasibility, methodology and benefits of removing contaminated sediments through dredging.

A memorandum of agreement (MOA) exists with a private developer to abstract 300,000 m³ per month of water from the Laguna lake for domestic use. This MOA represents an innovation in the management of the lake in cooperation with the private sector and local government units.

The MWSS-Laguna Lake 400 MLD (million liters per day) Bulk Water Supply Project is an offshoot of the original project proposal that calls for a 300 MLD bulk water supply capacity for Maynilad Water Services, Inc. to serve Paranaque, Las Piñas, Muntinlupa and five towns of Cavite. With the additional 100 MLD as requested by the Manila Water Company, Inc., the total requirement of the proposed project is now 400 MLD. The development of new sources is a commitment of MWSS to the two private operator-concessionaires.

Flood control. The lake serves as a reservoir for floodwater to save Metropolitan Manila from flooding. The Manggahan Floodway was constructed to divert floodwaters from the Marikina river into the lake. The Napindan control station regulates the outflow of excess lake waters and minimizes the inflow of saline water and pollution from the Pasig river.

Irrigation. The lake offers sufficient water for year-round irrigation of farmlands in the Laguna lake region. Studies are being done to further improve the use of lake water for agricultural applications.

Industrial cooling. The lake is used as a source of industrial cooling water. The major users include the National Power Corporation (for the Malaya and Sucat Thermal Power Plants and Kalayaan Hydropower Plant) and the Philippine Petroleum Corporation Refinery in Pililla, Rizal. Cooling water is recycled into the lake resulting in tolerable thermal pollution of about 2 °C rise in temperature near the discharge points.

Current Issues and Challenges

There are several issues and challenges which LLDA faces today, including:

- Scarcity of domestic water supply in Metro Manila and the adjoining provinces, and the vast potentials of the lake as a raw water source.
- Environmental pollution, optimizing the benefits from existing economic-based instrument for pollution control and abatement and designing appropriate market-based instruments as well as environmental and natural-resources accounting and pricing strategies.
- Equity and access to use/benefits from lake water and land lakeshore areas including allocation of quasi-property rights thereof.
- Conflicting policies, plans, programs and projects of other government agencies and the private sector.
- Setting the scenario for an effective organization and proactive management operation.
- Sustaining LLDA's corporate financial stability.

In response, LLDA has adopted the following strategies.

- Conserving and managing lake-water resources by entrusting these to their immediate communities and stakeholders.
- Sustain the “Sagip-Ilog” or River Rehabilitation Program as a model in multi-sectoral/multiagency river-basin approach to clean up and rehabilitate biologically dead and polluted rivers draining into the Laguna de Bay in order to prevent further degradation of the lake by way of:
 - actively supporting the various River Councils in the implementation of river rehabilitation plans; and
 - intensifying social mobilization for river rehabilitation through the Environment Army in recognition of its strength and potentials in arousing environmental consciousness of the local communities.
- Pursue the deconcentration of administrative functions over the Seven Lakes to the concerned local government units.
- Continue self-empowering and self-accreditation activities including deputation of small fisherfolks as Fish Wardens under the Bantay Lawa to assist the LLDA in anti-illegal fishing activities, monitoring and demolition of illegal aqua-structures.
- Transforming the Looc and Calauan assets and facilities into viable livelihood projects dealing with innovative fishery/food-production techniques through joint-venture partnership/profit-sharing schemes or lease arrangement with interested private sectors.
- Studying other economic-based instruments and expanding the coverage of the ongoing Environmental User Fee System to effect the transfer of the burden of cleaning up the environment to those who actually pollute the same, and channeling income derived for community-based environmental management projects including structural measures for river rehabilitation and pollution control.
- Adopting and implementing participatory consensus-building approaches to enhance democratic processes in resources management, such as the formulation of lake management and development policies and community-based projects dealing with reforestation, environmental management and control, river rehabilitation and information campaigns.

Programs and Priorities

In line with its thrusts and priorities, the following programs illustrate how LLDA intends transforming itself from a dominantly regulatory to a market/client-driven developmental agency:

- Environmental User Fee System.
- River Rehabilitation Program.

- Implementation of the Revised Fishery Zoning and Management Plan (ZOMAP).
- Shoreland Management.

The Environmental User Fee System (EUFS) is the centerpiece of LLDA's Environmental Management Program. EUFS is a market-based system following the "polluters pay principle." An environmental user fee is paid for every unit of pollution that one discharges into the Laguna lake or its tributary rivers. In the initial phase of the system, the user fee covered Biochemical Oxygen Demand (BOD). During the first year (1997) of implementation, EUFS was applied to all industrial wastewater discharges along the leading industry subsectors with an annual BOD load of 4,000 kilograms.

For the second and third years of implementation (1998-99), LLDA covered industries, subdivisions and commercial establishments as well as food chains and restaurants that are discharging wastewater, including firms practicing a zero discharge scheme, thereby abolishing the 4,000-kg/yr. BOD load cutoff. After the 3-year introductory phase, there has been a significant reduction in the BOD load into the lake. From 12.142 M kg BOD, based on the data set for 535 firms covered by the World Bank study in 1993, a 55.5-percent BOD reduction (6.74 M kg) was recorded in 1997, 24.08 percent (8.04 M kg) in 1998 and 73.6 percent (11.06 M kg) in 1999. Reduction was due to actual treatment, adoption of full recycling and voluntary closure or plant relocation.

The River Rehabilitation Program is a model in a multi-sectoral and multiagency river-basin approach with strong community-organizing and Information Education and Communication (IEC) components to form partnerships among LLDA, local government units (LGUs), people's organizations, civic organizations and NGOs to sustain the program. Such partnerships have given way to the formation of River Basin Councils all over the lake region. These councils are composed of representatives from various sectors of the localities through which the major tributaries of the lake traverse. These groups of environmental activists assume the responsibility for maintaining and safeguarding the cleanliness of the portions of the river/s that cut across political boundaries.

Also conceived under this program is the first ever Environmental Army in the world. This army of volunteer environmentalists will serve not only as extension arms of various government agencies and units mandated to protect the environment but also as the core group of a network of environmental watchdogs ready to report all acts or incidents of environmental pollution and degradation. To enhance the dedication and discipline of its members, all recruits undergo a rigid selection, training and motivation process implemented by LLDA. Furthermore, to broaden the support base of the river conservation effort, the formation of "environmental citizens" and "environmental youth" groups is underway.

Lake Fishery Management Program is the most feasible management system for equitable allocation of the lake fishery resource with emphasis on the full implementation of the Revised Zoning and Management Plan (ZOMAP) for Laguna lake and the deconcentration of LLDA's administrative functions over the Seven Crater Lakes. It aims to a) reduce the fishpen area from 25,000 to 10,000 hectares and 5,000 hectares of the fish cages area to 5,000 hectares, which is considered the lake's ecological-carrying capacity, b) adopt a water-resources pricing mechanism for aquaculture development through a public-bidding process, and c) reduce the possibility of pollution from aqua structures within and around the lake area.

Laguna Lake Shoreland Management refers to the proper management and control of the use or occupancy of shoreland areas that are to be highlighted by the demarcation of the required 12.50 m elevation around the lake. It is set to undertake the inventory of title holders, occupants, owners and claimants. The program has an intensive IEC component and provides an administrative system, which shall ensure that the rights of legitimate shoreland users are respected.

LLDA is undertaking various other activities to strengthen itself to undertake its expanded role effectively. These include:

- Master Plan Programs
 - Environmental Management Program
 - Fisheries Development Program
 - Watershed Management Program
 - Water Resources Development and Management Program
 - Environmental Education and Communication Support Program
 - Institutional Capability Building Development Program
- Foreign Assisted Projects
 - Sustainable Development of the Laguna de Bay Environment (Technical Assistance Grant from the Netherlands Government)
 - Laguna de Bay Environment and Water Resource Management Project (Institutional Building Technical Assistance Grant from the World Bank-Japan PHRD Fund)
- Policy Studies
 - Surface Water Resource Pricing
 - Tradeable Water Rights
 - EUFS Application to Households
 - Policy and Implementing Guidelines on Shoreland Facilities for Ferry Operation
 - Lifting the Ban on Reclamation
 - Air Quality Management Policies
 - Institutionalization of Philippine Economic and Environmental Natural Resources
 - Accounting in the LLDA

- Project Development
 - Reactivation of Calauan Water Quality Laboratory/Upgrading of Pasig Laboratory
 - Updating of the Interceptor Project
 - Establishment of Common Wastewater Treatment Facilities
 - Build-Operate-Transfer (or Build-Operate-Own) projects to establish terminal stations for ferry operations in Laguna de Bay

LLDA Organization and Management

LLDA management and operation are carried out by a corps of professionals in the field of limnology and environmental management, water-quality monitoring, pollution control, hydrology, water and wastewater analysis, regional-development planning, resource economics, community development, public information and forestry. A Board of Directors, composed of 9 members representing central and local government units and the private sector, serves as the highest policymaking body of LLDA. It is specifically tasked to formulate, prescribe, amend and repeal policies, rules and regulations to direct the corporate affairs and conduct of business of the LLDA.

LLDA management and operation are carried out through its Technical, Administrative and Corporate Management Divisions under the direct supervision of a General Manager and an Assistant General Manager. A group of professionals in the field of limnology and environmental management, specifically, water-quality monitoring, pollution control, hydrology, water, wastewater analysis, regional-development planning, resource economics, community development, public information and forestry, among others, form part of LLDA's staff complement.

A Board of Directors, composed of ten (10) members representing the central and local government units and the private sector, serves as the highest policymaking body of LLDA. It is specifically tasked to formulate, prescribe, amend and repeal policies, rules and regulations to direct the corporate affairs and conduct business of the Authority.

IWRM at the LLDA

To address these concerns, strategic intervention was initiated through a project named Sustainable Development of the Laguna de Ba'i Environment (SDLBE), a 2-year project assisted by the Government of the Netherlands. The objective of the SDLBE is to ensure future sustainable development of Laguna de Bay resources, based upon a sound knowledge of the functioning of the system, its users and the institutional setting, i.e., supporting IWRM, which aims to ensure the coordinated development of water, land and related resources to maximize economic and social welfare, without compromising the sustainability of vital environmental systems. The project is therefore specially directed at capacity building and developing practical and realistic solutions for current problems and issues regarding the lake, and focusing on drinking water supply, need for dredging and infrastructural works.

At present, an IWRM Unit at LLDA is responsible for supporting the balanced and sound management and development of the Laguna lake using the decision-support systems and expertise developed under the SDLBE. The Unit also serves as the focal point for review of technical and environmental projects for third parties. It coordinates and carries out integrated research projects to increase the water system and IWRM knowledge within LLDA.

Institutional strengthening of the LLDA has been the key activity of SDLBE. It has focused on planning and analysis for IWRM. Specifically, the objectives of the institutional support component are:

- To support the setup and development of the IWRM Unit at LLDA.
- To strengthen the capability of LLDA staff through intensive training on the technical aspects of IWRM.
- To extend the knowledge and understanding of the land and water-resources issues in the lake, including possible resource-use conflicts through the development and use of a comprehensive state-of-the-art Decision Support System.

The Future

The reengineering program of LLDA centers on the creation of a sustainable management model. The globalization of private investment funds and the development of innovative financing mechanisms will facilitate the rise of PSP in planning and implementation of infrastructural projects. The creation of the LLDA-owned Laguna de Ba'i Development Corporation shall establish competence through which the Authority may undertake infrastructural projects in the lake region by leveraging its resources with nonbudgetary capital.

Case 2. Upper Pampanga River Basin Coordinating Council (UPRBCC)

The Upper Pampanga River Basin (UPRB) is located in the heart of Central Luzon and comprises the provinces of Nueva Ecija, parts of Bulacan and Pampanga. The basin is the major rice-producing area supplying about 60 percent to 70 percent of the total rice requirements of the whole country. The government's prime concern is focused on food security for our growing population of about 74 M. Water demand for agriculture, food processors, domestic use, recreation and industries is projected to increase yearly which will put a strain on the available water resources. There is a felt need among the stakeholders, administrators and researchers to create a council that will formulate policies and provide the leadership and direction towards the national utilization of available water resources in the UPRB.

The Upper Pampanga River Basin Coordinating Council is an alternative IWRM institutional arrangement. The UPRBCC was created by an Administrative Order of the Governor of the Province of Nueva Ecija in 2002.

Functions and Composition of the Council

The UPRBCC is authorized by the Provincial government to:

- Orchestrate the planning, implementing and evaluating an IWRM program aimed at improving the water management in the UPRB.
- Serve as a policymaking body and a clearing house of ideas as far as planning and implementing programs and activities relevant to the effective and efficient water management in the UPRB are concerned.

In general, the council has the following powers, duties and responsibilities.

- Formulate policies, rules and regulations pertaining to the development and protection of wildlife, ecosystem, surface water and groundwater.
- Investigate whenever necessary all individuals, companies or entities that have committed violations on existing policies, rules and regulations related to water resources.
- Delegate police powers to the LGUs and/or Philippine National Police in the implementation of each policy, law and regulation related to the protection of the environment, beneficial use and allocation of water resources.
- Set or adapt standards for the disposal of agricultural and municipal wastes, and the use of agricultural chemicals and fertilizers.

Each agency represented in the Council is enjoined to adapt its respective duties and responsibilities according to the covenant on the Declaration of Commitment 2002. The Provincial Governor of Nueva Ecija presides over the council with members composed of representatives from each of the following agencies/stakeholders.

- Provincial Government of Nueva Ecija
- Upper Pampanga River Integrated Irrigation System (UPRIIS)
- Provincial Irrigation Office
- Provincial Agriculture Office
- National Power Corporation (NPC), Pantabangan
- Irrigators' Association (IA) within UPRIIS
- Water Districts (Nueva Ecija Water Districts' Association)
- Fishery Sector
- Provincial Environmental and Natural Resources Office (PENRO)

- Local Government Unit within UPRB
- Local Government Unit of Pantabangan, Nueva Ecija
- Central Luzon Agricultural Resources Research and Development Consortium members-agencies
- Central Luzon State University

The Provincial Governor of Nueva Ecija, as Chairman, is assisted by a Vice Chairman who is elected by all the representatives of the council. Core groups have been identified, each led by a group leader who takes the lead in the implementation of programs, projects and activities that may later be agreed upon by the Council. A Secretariat, currently hosted by the Central Luzon State University, has been initially created to assist in the coordination of the activities. Fund solicitation from various sources will be done to secure the needed funding for council operations.

Commentary

Clearly, these developments in Central Luzon are encouraging. However, it is too early to say whether such an arrangement would further flourish. At the moment, the Council is actively seeking out additional funds to augment its limited budget and technical assistance to support and sustain various planned research and coordination activities. Given more autonomy and independence, it will likely be able to decide how it will transform itself into an effective water-resources regional “coordinator.”

Its effectiveness will likely be determined by the extent to which it is able to secure cooperation with local authorities and its ability to address conflicts (which are still largely untested). The UPRBCC ought not to be viewed by its member agencies as a service agency but rather as an authority. Currently, its power and authority (scope of influence) and basic financial support emanate from the Provincial Government of Nueva Ecija and the Declaration of Commitment.

Case 3. The Bicol River-Basin Development Project

The basin is a subarea of the Bicol region in southern Luzon consisting of two provinces: Camarines Sur and Albay with a land area of 285,000 hectares, half of which is arable with a population of nearly 1.8 M (in 1975 when the project was implemented). The subsistence agricultural economy has created chronic underemployment (28%) and serious malnutrition among the population causing a relatively high rate of out-migration. In 1971, over 80 percent of the population had incomes below the national poverty level. In 1975, nearly 90 percent of the families had annual incomes below the poverty threshold. Nonagricultural jobs in the basin towns and villages were limited. Income and wealth are inequitably distributed. Ten percent of the households in the basin receives 43 percent of the total income, and the poorest 50 percent of the population receive only 13 percent of income, living on about US\$45 per capita a year. Housing conditions outside of the larger towns were also poor. In rural areas, homes are built of scrap wood and nipa, with grass roofs and bamboo or dirt floors. Less than a third of the households had adequate water supplies or sanitary toilets.

Stronger structures were scattered in rural barangays, but most of the houses were constructed of weak building materials and were easily destroyed by fire, floods or winds during typhoons. Few homes were served by electricity. Many used kerosene or wood for lighting and cooking. The annual population growth rate of 3.3 percent resulted in a high dependency ratio. Nearly half the population is under 14 years of age, and more than 1 percent of the population emigrates each year. Most migrants were the younger, more productive people seeking job opportunities in larger towns outside the basin, and usually in metropolitan Manila.

The Bicol region, of which the basin is a part, has had the lowest net domestic product in the country over the past decade; it declined in real terms by an average of 1.5 percent between 1972 and 1974, at a time when the national average was growing by nearly 4 percent. In the early 1970s, the Bicol region had the lowest share of employment and production among all regions in the Philippines and the lowest proportion of modern manufacturing establishments to population in the country. Indeed, the only industrial capacity in the basin takes the form of small, family-owned agro-processing and cottage industries. Nearly all manufactured goods sold in Bicol are imported from Manila.

Development Problems

Ironically, most Bicolanos lived in poverty in a land of great natural beauty and abundant natural resources. Properly irrigated and cultivated, the basin's rich alluvial soil could produce enough rice to sustain an additional population of 8.0 M. Production of corn, abaca, sugar, coconut and vegetables is only a fraction of the basin's potential under favorable conditions. The region also had a wealth of untapped mineral resources: about 30 percent of the marble deposits, 75 percent of the perlite and about 20 percent of the coal reserves of the country. The Tiwi geothermal plant, located on the basin's northeastern border, generated substantial amounts of relatively cheap energy.

As a regional economy, the Bicol river basin was poorly equipped for increased productivity and widespread development. Through much of the year the basin is battered by frequent typhoons, bringing high winds and heavy rains. The perennial flooding destroyed crops and homes, pushed saline water into interior rice fields and caused widespread silting and erosion. The area is physically isolated from the rest of the country during the worst of the typhoon season and poorly linked to other regions or to Manila even during good weather. A single paved highway weaves tortuously through the mountains to connect Bicol to Manila. During the typhoon season even this link becomes tenuous as sections of the road are washed out and collapse down the sides of steep mountains. Daily flights to and from Manila, buses, and one railway provide limited capacity for travel or interregional communications, and small ports in coastal villages provide limited access to inter-island trade. Regional transportation and communications are not much better, limiting travel and marketing, and leaving the basin's settlement system a scattering of relatively isolated and poorly integrated clusters of villages.

Land-tenure arrangements were not conducive to increasing family incomes. Farm holdings were small and fragmented. From a third to half of all rice and corn farmers work as tenants or landless laborers, and farm productivity was nearly 10 percent lower than the rest of the country. Owners of large estates reinvested little of their profits in the basin. Agricultural technology on both large and small farms was primitive. Manpower and draught animals provided the bulk of

agricultural labor. Relatively few milling or processing facilities have been established, marketing networks in rural areas were poor, and storage capacity, limited. Because productivity and income were so low, both tenants and small landowners were continuously in debt. Only about half of the basin's 100,000 hectares of potentially irrigable ricelands were irrigated; nearly 50,000 hectares of prime agricultural land is flooded during the typhoon season. Land located adjacent to the Bicol river suffers from saline intrusion.

The Institutional Response

Because of its large size, rich potential and severe poverty both the national government and international assistance agencies took a strong interest in the basin's development. The Bicol River Basin Development Program (BRBDP) was established by executive order in 1973 and strengthened by a presidential decree in 1976. The BRBDP sought to promote development of agriculture, natural resources, infrastructure, social services and private-sector investment through integrated rural development; to provide comprehensive but decentralized planning and management of programs and projects; and to combine national with local resources in attaining regional development goals.

The BRBDP and three other similar regional development programs were brought under the supervision of the National Council on Integrated Area Development (NCIAD) of the Office of the President. The Minister of Public Works served as coordinator for BRBDP and regional directors of national ministries and agencies operating within the basin; the governors of the participating provinces and the BRBDP program director form the Bicol River Basin Coordinating Committee (BRBCC). A council with representatives from private business, farmers and religious groups, the media, and civic and youth organizations was organized to advise the program. To facilitate local planning and program implementation, the basin was divided into Integrated Development Areas (IDAs), each with a development team headed by a municipal mayor, and consisting of local government officials, community leaders, and technical personnel from national ministries and line agencies working in the basin. Table 5 shows the different IDAs and the IDA projects. These area development teams are assisted with planning and technical tasks by BRBDP and line agency professional staff.

Table 5. Different IDAs and the IDA projects.

I	Libmanan-Cabusao IDA	VI	Quinali IDA	Multiple IDA Projects
II	Pili IDA	VII	Agro-industrial development IDA	<ul style="list-style-type: none"> • Secondary and Feeder Roads Project • Integrated Health, Nutrition and Population Project
III	Rinconada IDA	VIII	Sipocot-Del Gallego IDA	<ul style="list-style-type: none"> • Rural Water Supply Systems Project
IV	Naga-Calabanga IDA	IX	Partido IDA	
V	Bailway-San Vicente IDA	X	Caramoan IDA	

Project Components

Early success with regional planning and development in the basin attracted the attention of many assistance organizations. The World Bank, the ADB and the German and Japanese governments

later assisted with various projects identified in the Bicol Comprehensive Plan for 1978 - 1987. Over the next decade, extensive physical infrastructure, agricultural production, agribusiness, small-scale manufacturing and social-service projects were planned for the basin. Subsequently, a large number of projects were proposed, planned and implemented, including a farm-to-market road construction program; rehabilitation of the railroad from Manila to Bicol; irrigation and agricultural activities in several IDAs; investments in the industrial IDAs; upgrading the quality and expanding the facilities of local agricultural colleges; upgrading smaller ports in the basin, extending and improving domestic water supplies, and contributing to agribusiness, fisheries development, and rural industry studies; integrated project for health, nutrition and population; and technical assistance for capacity building to augment the BRBDP's staff resources. Table 6 shows the project components of the BRBDP, 1978-1987 program.

Table 6. Project components of the BRBDP, 1978-1987 program.

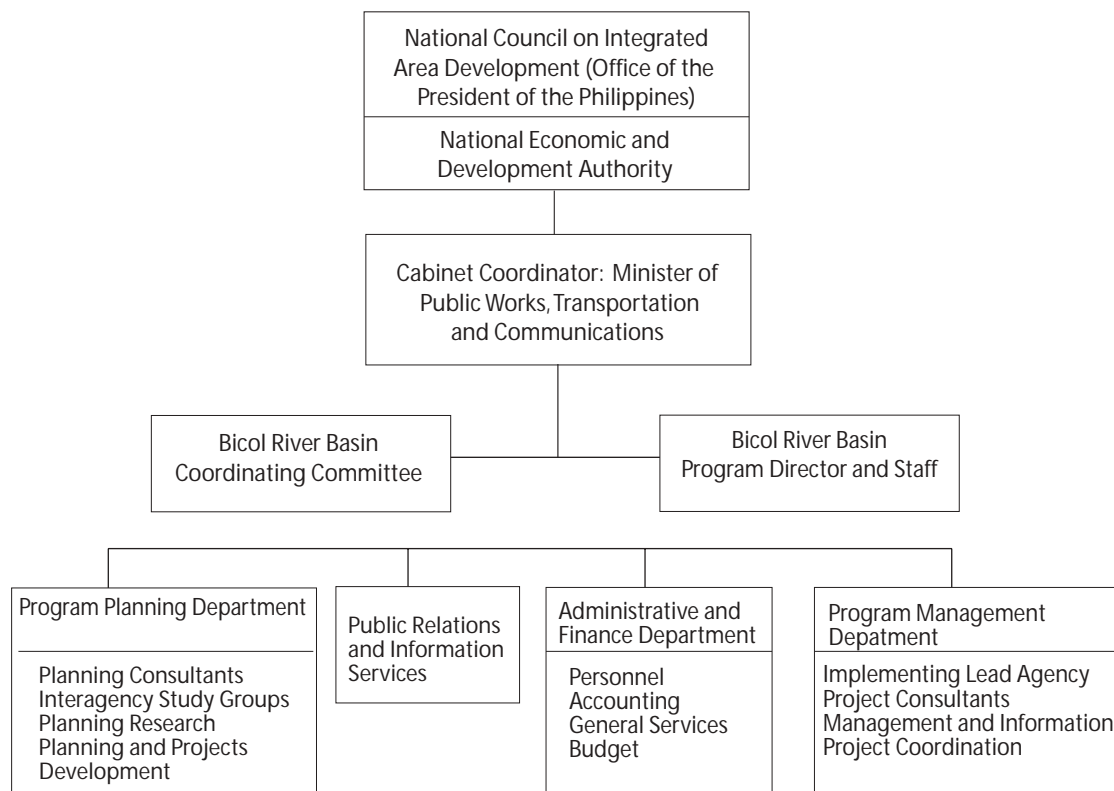
Physical infrastructure	A. Transportation	1. Secondary roads (rehabilitation and upgrading; construction; maintenance)
		2. Feeder roads (rehabilitation and upgrading; construction; maintenance)
		3. Ports (improvement/ports of entry; improvements /municipal port)
		4. Airport upgrading
	B. Telecommunications	
	C. Water resources	1. Irrigation/drainage
		2. Flood control
		3. Domestic water
		4. Watershed management
Agriculture	D. Power/rural electrification	
	E. Social infrastructure	
	A. Production intensification	
	B. Watershed protection	
	C. Natural resources conservation	
Industry	A. Agribusiness industries	1. Food processing
		2. Storage/warehousing
		3. Byproduct utilization
Social development	B. Household industry	
	C. Complementary industry	
	A. Health, nutrition, population	
	B. Research and extension	
Support projects	C. Land reform, housing, human resources development	
	D. Institutional development	
	A. Feasibility studies	
	B. Agricultural support	1. Land- and soil-resources inventory
		2. Land use hydrology
		3. Land-utilization-type development
		4. Timber, water impounding, breeding stations

Development planning, technical studies and project design have been funded in part by grants and loans with equivalent counterpart funds. Four major capital construction projects in water-resources development and secondary and feeder roads were implemented. Comprehensive studies of water resources, land classification and mapping, intermodal transport, hydrometeorology, and others were completed. Data collection and feasibility studies for agricultural education, health, nutrition, and population planning, crop production and compact farm projects are in progress, as is a comprehensive socioeconomic survey that will be updated every 3 years. An agribusiness reconnaissance survey, prefeasibility studies, and rural-industry analyses were also done.

Institutional Arrangements

The implementation arrangements for the various projects are shown in figure 1 below.

Figure 1. The implementation arrangements for the various projects.



Commentary

The BRBDP grew out of, and was initially conceived, as a response to the perennial flooding problem in the region. The project concept was expanded following the framework and strategy of Integrated Area Development (IAD) which was then being introduced. A pioneering project, the BRBDP was considered as a very promising model for integrated projects. The proposed cutoff flood channel

area in Canaman and Gainza was integrated into the BRBDP. The project's objective was consequently defined as: to increase the per capita income of rural families by increasing agricultural productivity and employment opportunities, providing for a more equitable distribution of wealth, and promoting agro-industrial and industrial development. The project was completed in the late 1980s, following a positive evaluation in 1985.

The BRBDP has long ended but the issues remain.

- *Eroded land washed into bay.* In 2000, it was estimated that about 24 hectares of agricultural land near the cutoff channels were lost due to erosion. About 1.0 M m³ of soil have been eroded and washed into the San Miguel Bay. The width of the river has increased by about 400 percent from 15 meters in 1957 to about 70 meters today. If the erosion is not stopped, it is estimated that in the year 2015 the width of the cutoff channel in Canaman and Gainza will be about 130 meters. This means an additional one million cubic meters of soil particles will be washed into the San Miguel Bay.

This soil sediment has destroyed hundreds of hectares of coral reefs in the San Miguel Bay and the Pacific Ocean, from which thousands of residents get their livelihood. Unfortunately, there was no strong environmental protection component in government projects at the time. Environmental protection was not among the objectives of the BRBDP.

- *Property and ownership threatened by erosion of the riverbank.* Many houses along the cutoff channels in Canaman have been moved away from the riverbank. Erosion has been constantly threatening to destroy these homes. There is also the continuing issue on the ownership of land adjacent to the river easement because of the eroding river easement. It is no longer clear to the residents where the limits of the easement and their properties are. The confusion has become a source of conflict among the residents.
- *Seawater inflow from the San Miguel Bay.* Another detrimental effect of the cutoff channel is the inflow of seawater from San Miguel Bay. While it is true that during the rainy season, the water drains fast into this bay, during the dry season, water from the bay also moves rapidly upstream, affecting some 65 percent of the rice fields in Canaman.

The BRBDP may have focused too much on its "fitting" into an IAD strategy, forgetting to address the very specific problem in Canaman and Gainza. Apparently, erosion control and environmental protection were not included in the project's initial P1.5-billion budget. Meanwhile, the funding "faucet" has run dry after the flurry of interest on an innovative river-basin approach of the early 70s. Years after the BRBDP, many of these rice areas still rely on rainwater for irrigation. As an economically depressed area, all of the project components were easily justified. The scope of the project expanded readily very easily in all directions.

Case 4. Agno River Basin Development Commission

The Agno River Basin Development Commission (ARBDC) was established in 1997 to oversee and coordinate all development along the Agno river basin and to ensure a holistic approach in water-resources planning and management of the basin. Its core functions are to a) develop a comprehensive master plan for the river basin; b) coordinate the integration of the master plan and

the local and regional plans and investment programs; c) cause the implementation of development programs and projects with an overall impact upon the basin; d) initiate, receive and recommend project proposals for the development of the basin; e) formulate, review and propose improvements on existing policies governing that development; f) commission, coordinate and monitor all planning studies and research and other development undertakings related to the basin; g) coordinate soil-erosion prevention, river-siltation mitigation, flood control and other projects among the concerned government agencies; and h) establish a functional basin-wide information and database system including computer-generated planning tools such as GIS. ARBDC was organized to fulfill one of 17 conditions demanded by the Local Government of Itogon, Benguet, in exchange for a favorable endorsement of the San Roque Multipurpose Dam Project (SRMDP). The ARBDC was also seen as a convenient mechanism for implementing technical assistance, such as watershed management. The Executive Director of ARBDC is appointed by the President.

The US\$1.19 billion, 345-megawatt SRMDP is being hailed by the hydropower industry as a major success story in private-sector financing. No other private hydro project of its size has been able to secure the necessary financing, particularly in high-risk, economically embattled Southeast Asia. When completed, San Roque would be the tallest dam, at 200 meters in Asia and the twelfth largest in the world. It will provide power to the burgeoning mining, agribusiness, export industry and tourism centers planned for Northwestern Luzon. The government also claims that the project will irrigate 87,000 hectares of farmland. It is also expected to reduce the perennial flooding of at least 16 downstream towns during the rainy season affecting 150,000 residents living in 39,504 hectares classified as watershed areas. It will also provide clean water to affected communities in Northern Luzon.

Since construction began in February 1998 and nearly 75 percent complete, the SRMDP continues to be mired in controversies—claims and counterclaims—between proponents and community activists. The flood control alone will displace thousands of households, dislocate Ibaloy and other tribal communities weakening their traditional values and wipe out more than a thousand hectares of farmlands and fishponds. And due to “watershed protection,” the watershed is subjected to various land-use restrictions and prohibitions on land clearing, farming, animal grazing, gathering of forest products and small-scale mining.

Unlike LLDA, which is an authority, ARBDC relies mainly on the commitment and participation of all related agencies. Under these circumstances and within its limited resources, ARBDC has initiated a strategic plan for managing the river basin. Important achievements of ARBDC include the establishment of a strategic plan and ongoing efforts to implement it.

The ARBDC has prepared a plan for integrated watershed management and has approached the Japan International Cooperation Agency for funding assistance. It has likewise held informal talks with the Swedish International Development Assistance for possible areas of cooperation.

Commentary

This case highlights the outcome of attempts at IWRM in the face of a “mega-bucks project” situation with high stakes and high-powered vested interests (with private sector investment) at play. Ranged against all the controversies and the political and financial interests accompanying the SRMDP, ARBDC does not have sufficient clout and position to be a fair and effective broker. As a product of a compromise between local governments in exchange for endorsement, it is principally seen as a weak extension of the implementing agency, even if it is headed by a presidential appointee.

Not surprisingly, ARBDC focused on its technical functions and minimally addressed the mainstream social conflicts attending the dam construction. It thus became peripheral to the major issues of the day. A quick review of its terms of reference will easily reflect this inadequacy.

Without taking any position of the social controversies, the significant lessons which can be drawn for IWRM agencies involved in large-scale projects, like dams, are:

- Big multipurpose hydroelectric dams, for example, adversely affect indigenous people who may not get any direct benefits from being displaced. In the 1950s and 1960s, hundreds of Ibaloi families were dislocated when the 75-MW Ambuklao and 100-MW Binga dams (upstream of the San Roque Dam) were built along the Agno river. Linked to the Luzon grid, the power generated by the two dams has helped supply the power needs of mining companies and cities as far as Manila, which is more than 300 kilometers away. On the other hand, the Ibaloi communities around the two dams were energized only in the 1980s and their claims for compensation have not been fully settled.
- Lodge responsibility and accountability for adversely affected people to an adequately funded agency. Do not put project proponents in charge of acquiring consent. Encourage and facilitate a role for stakeholders and civil society. NGOs, indigenous groups, church groups, and other members of civil society are very important in securing informed consent. They are stakeholders with crucial social, environmental, and technical input; and as partners that monitor and advise both the consultation process and project activities. Wherever possible, these members of civil society should be encouraged and facilitated in serving this vital public role.

Development of the Regulatory Function

Nature and Scope of Regulation

In the final analysis, regulatory arrangements are established to ensure sustainable exploitation of the resource among various users. A regulatory framework is necessary to monitor and control the provision of public services, whether they are private or public. The main objective of regulations is to achieve fairness among stakeholders, principally the customers and the service provider. The absence of a clear regulatory system and nonenforcement of existing regulations are two main causes of unreliable service. Specifically, regulatory systems are designed for the following purposes:

- To ensure compliance with standards of acceptable service.
- To protect the customers from possible unfair practices by the service provider.
- To create a business environment which promotes commercial viability.
- To protect the environment.

Regulatory arrangements are intended to ensure that the service providers are effectively and efficiently delivering the service to the individual households and the city and at a reasonable price. The regulatory arrangement also aims to ensure that service providers are fairly compensated for

the costs incurred to provide the service. Regulatory arrangements are established to benefit both users (individual households, businesses and the service providers). It also seeks to ensure that the environment is not adversely affected.

To be effective, the regulatory systems should be as independent as possible. The regulator should have no direct responsibility for actual provision or delivery of the service. “Direct responsibility” includes, for example, approval of operating budgets, financing of capital improvements and supervision of operations of the service provider. All the activities and discussions of the regulator should be transparent as a matter of public record. The regulator should be credible and sensitive to the views of all the involved stakeholders, particularly, the residents. As the economy changes, the regulatory body will have to be continuously strengthened and renewed to keep up with, and even promote, institutional, legal, technological and financing innovations introduced into the sector.

Generally, four areas of regulation over the use of water resources are used: resource-allocation regulation, tariff regulation, environmental regulation and operations regulation.

- The aim of the resource-allocation regulation is to ensure that all citizens have access to water resources depending on their intended beneficial use. Resource regulation covers the overall management of water resources with respect to utilization, exploitation, development, conservation and protection of water resources. Resource regulation basically delves into the formulation, integration, coordination and implementation monitoring of all government policies, plans programs and activities relative to the water-resources sector. It basically deals with allocation issues affecting water use by the different sectors of the economy.
- The aim of tariff regulation is to create a substitute for a competitive environment in order to obtain a balance between the service and pricing that could be reasonable if true direct competition (or service alternatives) existed. Tariff regulation tends to be the most difficult aspect of regulation since it involves social, political, technical and financial factors.

The aim of environmental regulation is to ensure that national and local standards, rules and regulations are observed. Environmental regulation is done independently from the environmental and health impact monitoring activities that may be implemented by service providers. Environmental regulation is external while environmental monitoring by service providers is an internal activity and done more frequently.

The aim of operations regulation is to ensure that the services are delivered in an efficient and effective manner. This involves the regular external review of service provider’s performance based on a set of clear and measurable performance standards. Operations regulation may include financial and technical audits. It involves monitoring to ensure that the environment is not adversely affected by the operations of the service provider. It may also include a survey of consumer satisfaction with the quality of service provided (or public performance assessment).

In the Philippines, the full scope of regulation described in the foregoing is, in fact, still exercised by several agencies.

- Water-resource allocation and water-rights policies are within the authority of the NWRB. NWRB issues water permits specifying a withdrawal level. It also adjudicates conflicts among water appropriators.

- Water tariff review and approval functions have most recently been further centralized at NWRB. Approval authority used to be vested with the LWUA (for water district tariffs) and with the NWRB for all others. The court system, of course, remains the final arbiter in conflicts. In the case of irrigation service fees, the fees are set by mutual agreement between NIA and the IAs.
- Environmental regulation is a main concern of DENR. It is empowered to monitor and regulate discharge of wastewater back to natural water bodies. In addition, DENR is the mandated protector of the watersheds. By establishing withdrawal limits on surface water and groundwater the NWRB also shares in this environmental-management regulation.
- Operational regulation, including franchising is exercised by both LWUA (for water districts) and NWRB (for all others). Taking over from the former Public Service Commission, the NWRB is authorized to issue Certificates of Public Convenience and Necessity. All water services providers, except water districts, are required to secure such franchises. It is not clear if operating systems of LGUs for their constituents are also required. LWUA, on the other hand, closely monitors (through monthly reports and regular visits) the operation of water districts, and those which operate inefficiently or ineffectively (or fail to meet debt service obligations) can be sanctioned by LWUA.
- In addition, the National Drinking Water Standards have been established. The DOH has the responsibility and the regulatory power to stop the operations of water systems not delivering potable water. LWUA also exercises this power over water districts.

Regulatory Issues

Clearly, the National Water Code of the Philippines vests NWRB with the role, function and authority to be the sole regulator on all water-resources allocation issues. There are provisions however in the Local Government Code which grant to local executives the power to regulate the use of “natural resources” within its jurisdiction. The extent of LGU regulatory powers under the Local Government Code have yet to be tested.

Executive Order 123 was issued on 11 September 2002 reconstituting the NWRB (removing agencies that are potential interested parties to any decision it may have to make). The Board today consists of DENR Secretary (Chair); NEDA Secretary-General (Vice); Secretary of Justice, Finance, Health; Director of National Hydraulics Research Center and the Executive Director of the NWRB Secretariat. The new Executive Order also transfers tariff approval of water districts from LWUA to NWRB. This most recent Order signals the more significant role of DENR in the water-resources sector.

Commentary

It is interesting to review the evolution of the drinking water-supply tariff review and approval function which NWRB currently undertakes. NWRB inherited this tariff review and approval function from the former Public Service Commission (PSC). The PSC was basically a utility regulatory body. More than ever, NWRB’s major bottleneck today is the rate-approval process.

One can reasonably question whether NWRB is designed to be a tariff review and approval body in the first place since its chief function is resource regulation. As a resource regulator, its principal tools ought to be, for example, assessments for groundwater extraction or for withdrawal of surface water for consumptive or nonconsumptive uses. Worse, the exercise of the tariff review and approval process distracts it from its main function of resource regulation. Many hours are spent untangling claims and counterclaims about the fairness of tariff adjustments.

In the future, it may be better for water-resources regulators, like NWRB, to gradually move away from tariff review and approval function which is basically a commercial transaction balancing affordability with financial viability of service utilities. To make a fair and balanced determination of the fairness of tariff requires that it be in a position to assess demand and affordability levels and financial condition and operational efficiency of water utilities—something it is unable to do on a national scale with any real depth. NWRB ought to focus on economic pricing of water, not the financial pricing issues between service providers and consumers.

These same arguments may be used against its powers to issue the Certificate of Public Convenience and Necessity (CPCN), which allows an entity to operate as a water supply provider. These functions ought to be exercised by a public-utility regulator.

Participation of Users

There are more initiatives to mobilize and institutionalize broad partnerships between the government and NGOs of all kinds to put vision to action and monitor performance in order to develop a strong, gender-sensitive water culture at all levels. The formation during the workshop of the Philippine Water 21 Partnership was conceived as the first step to jumpstart the vision into action. The partnership is expected to promote the national framework for action by generating ideas and convincing others to come up with their own sets of activities in order to flesh out the framework. In this spirit, NWRB and the Philippine Center for Water and Sanitation along with the International Training Network Foundation have taken up the challenge to lead the partnership. Since holding the workshop, NWRB has reportedly initiated various activities to further examine the sectoral action plans. These plans are deemed complicated because they involve specific targets and performance indicators, including milestones for monitoring the performance of the respective sectors in relation to targets. With a common level of understanding on where to go, NWRB expected to effectively play the leadership role, as recommended by the workshop, so that the national water vision for 2025 would be achieved with the support of the government, NGOs, academia, the private sector, international partners and other bodies.

At the project level, these are more and more capital-development projects, which secure the real participation of user groups in the planning, implementation and operation of water-related facilities. Through deliberate consultation and consensus-building, more and more projects are being developed hand in hand with the users. There are irrigators' associations, village water and sanitation associations, etc.

More policies and incentives are needed, though, for the emergence of a viable private-sector presence in the sector. The small-scale informal private sector still operates under a system of patronage.

Applying Practical Management Tools and Structures for IWRM

The practical management tools required will vary from situation to situation. One of the central IWRM challenges is to find the right mix of management tools. Such tools range from water-resources assessment, demand management, social-change instruments, conflict management, regulatory instruments, economic instruments and information and communication instruments.

Adopting a Shared Vision and Framework for Action

“By the year 2025, water resources in the Philippines are used efficiently, allocated equitably and managed in a sustainable manner, with provision for water-related disasters.” This national water vision was formulated through a series of national workshops with a view towards developing a framework for action on IWRM, starting from the assessment of the need to apply IWRM.

From the results of the national consultations conducted, it is important to note the recognition and appreciation of the need for consistent and fruitful implementation of the national water vision. All other concerned agencies expressed their keen interest in being involved. The implementation of the national water vision was examined through the various stages of the strategic planning process during the national roundtable workshops. In such a process, the analysis took into account the need for a sustainable program of action and in particular for the effective integration of these efforts and activities into the national development process. The planning analysis also included the implications of the participatory approach, the need for brief institutional analyses, key approaches to planning and management and good governance principles. From the strategic planning analysis, the opportunities identified reflected the actual conditions and stage of development of the country.

For the smooth and consistent implementation of a national water vision, the lead agencies were identified. As the government coordinating and regulating agency, NWRB agreed to take the overall lead role in the implementation of the national water vision and the proposed framework for action. In addition, the Philippine Water 21 Partnership was formed to jumpstart the vision into action. During the workshop, most of the participants expressed their commitment and readiness to join the partnership.

In order to achieve the national water vision, a framework of action would include the following:

- Managing water resources efficiently and effectively by a) creating an environment for sector agencies enabling them to perform legislation, regulation, resource mobilization and investment generation, b) eliminating or significantly reducing wastage (pricing, reduction of nonrevenue water, education, research and development), and protecting aqueducts and supply lines.
- Expediting socially responsive private-sector participation and enhancing public-private partnerships.

- Moving towards integrated river-basin management by increasing the number of river-basin authorities from 2 to 18 by the year 2025, and protecting water resources and integrated watershed management.
- Advocating political decisions and political support to implement the vision.
- Mobilizing and institutionalizing broad partnerships between the government and NGOs, people's organizations, private sector and academic bodies, etc., to put the vision into action and monitor performance with a view to develop a strong gender-sensitive water culture at all levels.
- Moving towards adequate and affordable water, sanitation, sewerage services favoring the poor and marginalized sectors of the society.
- Putting in place a monitoring and evaluation system with a view to improving performance and accountability.
- Recognizing the overwhelming need to create a government authority responsible for policy formulation and law enforcement.

A 4-year plan of action was drawn up to implement the national water vision. To start with, various public events were organized to disseminate the Philippine water vision. Bills on water pending in Congress, including the Clean Water Act, were revisited with a view to integrate them into a single bill.

Improving Water-Resources Planning and Coordination Systems: Medium-Term Philippine Development Plan (MTPDP) 2001 to 2004

The Medium-Term Philippine Development (MTPDP) 2001 to 2004 explicitly declares that IWRM is the guiding principle and policy paradigm for water-resources management. The MTPDP states that sustainable development and management of water resources through appropriate policy and legal reforms, particularly in resource exploitation, allocation, prioritization, optimization, protection and conservation shall be pursued. The Plan also states that the promotion of an integrated approach that will link social and economic development with environmental concerns shall be emphasized. The details of the MTPDP were presented in section 2 of this report.

In the Philippines, the function of the Investment Coordinating Council of NEDA is crucial. The ICC reviews and approves all major technical-assistance and public-investment proposals. All water-resources projects have to undergo the scrutiny of the ICC for consistency with the MTPDP and other sector policies and priorities.

Water Resources Regulation and Demand Management Tools: Regulation of Resource Use (Water Permitting Systems)

Under the Water Code, no person, including the government can appropriate water without a water right. A water right is evidenced by the issuance of a water permit. A water right is a privilege

granted by the government to appropriate, use and develop water. “Appropriation of water” is the acquisition of rights over the use of water or the taking or diverting of water from a natural source. Applications for water permits are filed with NWRB. In determining whether to grant the permit, the Board considers any or all the following factors: a) availability of water; b) water supply needed for beneficial use; c) prior permits granted; d) possible adverse effects; e) land-use economics; f) any protest filed; and g) other relevant factors.

In accordance with the Philippine Constitution, only the following may apply for a water permit:

- Citizens of the Philippines.
- Associations, cooperatives and corporations duly organized and registered under Philippine law with at least 60 percent of its capital owned by Filipino citizens.
- Government entities and instrumentalities including government-owned and -controlled corporations.
- Water permits are applied for, and granted by, the NWRB for the following:
 - Appropriation of water for domestic, municipal, irrigation, power-generation, fisheries, livestock raising, industrial, recreational and other purposes.
 - Changes in the purpose of appropriation.
 - Amendment of an existing permit, such as change in the nature of diversion, amount of appropriation and period of use.
 - Transfer or lease of a water right.
 - Temporary appropriation and use of water.
 - Lowering or raising the level of water of a lake, river or marsh or draining the same.
 - Trans-basin diversion.

Water permits are not necessary when: a) the owner of the land on which the water is found uses the water only for domestic purposes; or b) natural bodies of water used for washing or bathing or appropriated using hand containers. Enforcement of registration requirements has been difficult, particularly those involving minor withdrawals and for exclusively domestic use.

Certificate of Public Convenience and Necessity (CPCN)

Under the Public Service Act (Commonwealth Act 146, as amended), no public utility may operate in the Philippines without possessing a valid and current CPCN issued by the Public Service Commission. For water utilities, the power to issue CPCNs has since been transferred to the NWRB since October 1977 through PD 1206.

The NWRB needs the consent of MWSS to grant a CPCN to a private utility operating within metropolitan Manila. After privatization, concessionaires enjoyed exclusive rights to provide water and sewerage services in the area, except in those already served by private utilities at the time of

privatization. The concession agreement provides that MWSS may grant new permits to third parties only if concessionaires are either unwilling or unable to provide services at the standard rates and at substantially similar terms as set forth in the new third-party license. In addition, the duration of a new license to a new third-party provider cannot exceed 10 years. Further, it can be terminated after a minimum of 60 days' notice if concessionaires notify MWSS and the NWRB in writing that they are in a position to provide the services. In effect, this provision allows concessionaires to retain an indefinite right to supply any new customer in the MWSS service area. As of September 2000, the NWRB has issued only 226 valid CPCNs in various parts of the country, mostly near the Metro Manila area (table 7).

Table 7. List of CPC/CPCN grantees as of September 30, 2000.

Location	Privately owned water system	Residential commercial subdivision system	Industrial subdivision system	Total
Bataan		1		1
Batangas		1		1
Benguet		1		1
Bohol		2		2
Bulacan	1	12		13
Cagayan de Oro		2		2
Camiguin		1		1
Camarines Sur		2		2
Cavite		14	2	16
Cebu		6		6
Davao	6	9		15
Iloilo	2			2
Laguna		30	4	34
Leyte		2		2
Lucena		1		1
Masbate		1		1
Mindoro		1		1
Negros		3		3
Palawan		2		2
Pampanga		10		10
Pangasinan		2		2
Rizal		17		17
Samar		1		1
South Cotabato			1	1
Tagaytay		1		1
Tarlac		1	1	2
<i>Subtotal: Provincial areas</i>	9	123	8	140
Caloocan City		12		12
Las Pinas		8		8
Mandaluyong City	1			1
Muntinlupa City	2	6		8
Paranaque	6	29		35
Pasig		1		1
Quezon City	1	15		16
Taguig	2	1		3
Valenzuela		2		2
<i>Subtotal: Metro Manila area</i>	12	74	0	86
Total	21	197	8	226

Commentary

The very low rate of issuance of CPCNs is indicative of the low compliance rate and capacity issues within NWRB to enforce the regulation requiring CPCN for private-water service providers. NWRB, until today, does not have a nationwide reach to enforce its regulations. Only those near Metro Manila have applied for their CPCNs.

As mandated under Presidential Decree 1206, the NWRB regulates and controls the operation of public-water supply services outside the jurisdiction of MWSS and the LWUA. In addition to granting water rights, the NWRB issues certificates of public conformance to private utilities. In practice, because of staff shortages, the NWRB does not actively enforce standards, especially outside Manila, where it relies on staff of the water districts, the Department of Public Works and Highways or NIA for on-site inspection, as NWRB agents or “deputies.” The “agent” arrangement has not really flourished since the available agents themselves are, in all instances, interested parties or water resource users.

NWRB Tariff-Review Guidelines

The scope of NWRB regulatory authority includes approval of the water tariffs which private operators, now including water districts, are allowed to charge. NWRB believes that a public utility is entitled to such tariff which will permit a fair return on its assets and properties employed for the convenience of its customers. The tariff should be sufficient to assure confidence in the financial condition of the utility as an efficient and well-managed and credit-worthy organization.

NWRB applies two (2) methods for reviewing application for rate adjustment: (1) break-even operations for consumer-owned communal facilities and (2) for investor-owned facilities. Clear guidelines and processes are in place to guide the public. The NWRB has adopted the policy of allowing private utilities to earn no more than 12 percent on invested capital. The key estimates or parameters which NWRB carefully reviews are the operating expenses, the number of connections, the average consumption and the projected efficiency of the system.

One of the most significant components of the tariff adjustment is the power cost adjustment, which can be passed on to water consumers. The power tariff has a currency adjustment clause, but the rate increase cannot exceed 80 percent of current rates. The enforcement of such adjustments involves submission of past operational data as justification (it is not automatic).

Valuation of Property and Equipment in Service

Determination of “fair value” of assets and equipment constitutes a controversial issue. The utility may have assets which are not exclusively or directly “used and useful” for its water supply function. When original costs cannot be definitely ascertained, an agreed estimate of the original cost becomes necessary. The net book value of the property or equipment is based on the utility’s records and/or the previous reports showing original costs and depreciation submitted to NWRB. The “useful economic life of equipment” is the average expected life of all new equipment in service (table 8). The average useful life in years below are used by NWRB to compute the annual sinking fund provision.

Table 8. Equipment and their average useful life.

Equipment	Average useful life
Deepwell casing	15
<i>Pump assembly for:</i>	
Booster pumping station	20
Deep well pump	10
<i>Motors for:</i>	
Booster and line shaft turbine	5
Submersible pump	5
<i>Motor Controls for:</i>	
Deep well pump	7
Booster pumping station	20
<i>Reservoirs:</i>	
Concrete	40
Steel tank and tower	25
Steel tank at ground level	30
<i>Pipelines</i>	
Cast/Ductile iron pipes	60
Steel pipes with cement lining and coal tar or bituminous coating	40
Asbestos and plastic pipes	30
Steel pipes, cylinder type with concrete encasement and cement mortar lining	20
Valves and chambers	30
Fire hydrants	20
<i>Pump Houses:</i>	
Mixed materials (GI, wood, concrete)	10
Reinforced concrete	40
Chlorinating equipment	10

There is also a serious backlog in tariff adjustment applications. A cursory review indicates there is a time lag of one to two years between the filing of a rate adjustment to approval. This leads to a serious cash flow squeeze on private operators. There are just not enough hearing officers to attend to the various tariff hearings.

Regulatory Arrangements in the Privatized MWSS Service Area

The bases for the regulatory arrangement are found in the concession agreement itself. Under the agreement, an MWSS Regulatory Office (MWSS-RO) was established to regulate all aspects of water supply operation, including tariff setting, water quality, customer service and environmental standards. The Regulatory Office is under the jurisdiction of the MWSS Board of Trustees, but in keeping with national government commitment, the MWSS-RO enjoys some level of autonomy outside the purview of the Board.

The concession agreement states that subject to the limitation of Section 12, standard rates may be adjusted in the following three cases: annual inflation, extraordinary price adjustment and rebasing.

$$\text{Rate Adjustment Limit "RAL"} = C + E + R$$

where, “C” refers to the percentage change in Consumer Price Index in the Philippines for July as published by the National Statistics Office (NSO) to be applied in the immediate charging year.

“E” refers to an extraordinary price adjustment as determined by the MWSS-RO in accordance with Article 9.3 of the Concession Agreement.

“R” refers to the Re-Basing Convergence Adjustment as determined in accordance with Article 9.4.3 of the concession agreement.

A three-member appeals panel was created to clarify and resolve disagreements arising out of the contract. The MWSS-RO and the two concessionaires designate the three panel members for every re-basing period. In cases of major disputes, the two concessionaires jointly designate one representative. MWSS-RO nominates the second member; and the President of the International Chamber of Commerce designates a third member who chairs the panel. Such issues may include “appeals over re-basing, determination of grounds for extraordinary price adjustments, the calculation of the termination amount or the amount and price of bulk water transported from west to east, the delegation of responsibilities between the two concessionaires in the joint venture, or notices of termination. Panel decisions are binding within 90 days. With arbitration, concessionaires waive further appeals. MWSS also waives its sovereign immunity.

Stakeholder Participation in Water-Resources Management

Philippine Water Partnership (PWP)

A multi-sectoral group, composed of government, private sector and civil society, was formed to help government manage water resources. A multi-sectoral group has been formed to help accelerate government efforts in managing the country’s water resources by promoting and developing an IWRM approach in sustaining the country’s water resources.

The PWP networks organizations from the different fields of water management, particularly, the stakeholders who are not normally consulted on water management issues. It undertakes a continuing program of dialogue, advocacy work and consultation process among stakeholders to call the attention of the national leadership, issues and recommendations that require urgent action. PWP will serve as a neutral ground for discussing IWRM issues among a wide range of stakeholders. It will also pursue sustained advocacy work and capacity building at all levels and across subsectors. The PWP partners include: NEDA, the Department of Public Works and Highways (DPWH), the Department of the Interior and Local Government (DILG), the NWRB, Philippine Center for Water and Sanitation (PCWS), Cebu Uniting for Sustainable Water (CUSW), Philippine Watershed Management Coalition (PWMC), the LLDA, NIA, the Local Water Utilities Administration (LWUA), MWSS concessionaires (Manila Water Company, Inc. and Maynilad Water Services, Inc.), the San Pablo Water District, the University of the Philippines and the Ateneo de Manila University.

Philippine Center for Water and Sanitation (ITN Foundation)

PCWS-ITNF's development approach is integrated water resources management (IWRM) with people's participation. At the community level, ITN helps establish appropriate local water supply and sanitation structures. It also facilitates the organization of water and sanitation centers, river basin task forces, water conservation volunteer groups, rural water and sanitation associations, etc., to help develop and implement community-based water resource management projects. Engineers of PCWS-ITNF develop and test locally-suited technology on water supply and sanitation. These are then shared with local communities through training and publications.

Development of Water Information Systems

The MTPDP prescribes that water resource regulation should be carried out on the basis of IWRM under a river basin approach. The resource regulator is thus expected to develop, maintain and manage integrated databases and information systems that will provide the necessary data for decision-making purposes.

The collection of water data in the Philippines has always been the responsibility of many agencies just as there are many agencies concerned with water resources development and management. In some agencies, data collection is one of their primary responsibilities. Other agencies are basically development or regulatory agencies whose data collection activity is only a secondary responsibility. The data collection by each of these agencies is usually limited to only the particular element of the water database that is needed by the agency to carry out its mandate. Access to the database of the various agencies is inconvenient. Very few agencies publish their data collection regularly. Most data have remained as unpublished reports in the files of various agencies.

While there are many agencies collecting data on stream flow, groundwater and water quality in the country, much of this information is project-oriented. The observations in the data stations are generally terminated once the objectives of the project studies are completed. There is no deliberate program to carry out long-term observations among the subsector agencies. The only agency dedicated to long-term observation is the Bureau of Research Standards (BRS) which is in charge of stations with long periods of records.

The other major agencies collecting stream flow data are the National Power Corporation (NPC) and NIA. The BRS network includes about 630 stations of which only 274 are currently maintained. The NPC Network includes some 377 stations of which 125 are maintained. The NIA Network includes 162 stations of which about 43 are maintained.

Development of the National Water Information Network (NWIN)

Current water data collection is in a poor state with inadequate network coverage, lack or worn-out monitoring equipment, scattered data collection responsibilities, fragmented data records and absence of an integrated water resources databases. In 1995, the Government requested the World Bank to assist it strengthen overall water resources management and regulation at the national and regional levels. NWIN is one of the activities under the Bank-assisted WRDP. NWIN is a centerpiece of the government's efforts to strengthen the NWRB. NWIN is a joint effort among the participating agencies to gather together data on water to come up with a broad picture of the water sector for better decision making on conservation and exploitation. NWIN will establish and improve the

national water data collection networks for the monitoring of surface water, groundwater and water quality.

When fully, operational, NWIN will be a computer-based network system that electronically links the databases of water resources data collection agencies providing easy access to user agencies. NWIN's will utilize leading edge telecommunication and computer technology, both in hardware and software, complemented by trained personnel. The NWRB will act as the central repository of databases (or hub) to which the various participating agencies will be linked. Initially, NWIN will link nine agencies: PAGASA, BRS, EMB, DILG-WSSPMO, MGB, LWUA, NEDA, NWRB and NSCB.

With respect to water data collection, the principal agencies with sustained major involvement country-wide are the following:

- DPWH's Bureau of Research and Standards (BRS) —DPWH Regional Offices on surface water or streamflow.
- DENR's Environmental Management Bureau (EMB) and its regional offices on water quality of rivers, lakes and other water bodies.
- DENR's Mines and Geoscience Bureau (MGB) on groundwater and river-water quality affected by mining activities.
- DOST's Philippine Atmospheric Geophysical and Astronomical Services Administration (PAGASA) on rainfall and climate.

The NWDCN Studies

In early 2001, the NWRB engaged consulting firms to design and implement the National Water Data Collection Networks (NWDCN) for monitoring stream flow, groundwater and water quality. The Consultants' tasks covered:

- Preparation of policy guidelines on data collection.
- Design of a network improvement plan based on rationalization and consideration of technical and financial efficiencies.
- Design of databases.
- Implementation of the Phase I pilot improvement plan.

The outputs of the consulting firms are several volumes of final reports covering:

- Three basically independent primary networks each for stream flow, groundwater and water quality.
- Initial improvement programs (or Phase 1) in a three-phase implementation plan of the primary networks, considering the national priorities and available resources under the WRDP.

- Three Databases with corresponding computer software.
- Policy guidelines and technical criteria on water data collection and monitoring.

Integration Study (April 2002-)

Although there are executive summaries of the separate final reports, the need to integrate the related major results and undertake follow-up actions on some of the significant recommendations were recognized by the NWRB. Such integration study aims to:

- Combine the recommended primary monitoring networks of the three studies for an integrated water resources monitoring and management; including an assessment of the implementation of Phase 1 pilot improvement stations.
- Enhance the separate databases on surface water, groundwater and water quality for appropriate operation by the National Water Data Coordination Center (NWDCC); including capacity building of concerned principal cooperating agencies, namely: the Bureau of Research and Standards (BRS) of DPWH, the Mines and Geoscience Bureau (MGB) of DENR, and Environmental Management Bureau (EMB) also of DENR.
- Formulate the policy guidelines for the implementation of the integrated water resources monitoring and management considering the operational databases and the integrated primary network of water resources monitoring.

Proposed Integrated Primary Network

The integrated primary network for stream flow, groundwater and water quality monitoring was designed for each of the 12 water resources regions country-wide. For the integrated network, the stream flow gauging stations and groundwater monitoring wells are designated stations for observation of the basic water quality parameters. By such designation, sustained regular observations of water quality are assured in the long-term, besides providing the backbone of a rationally spaced distribution of stations in the river basin or water resources region. The number of stations on the primary network in each of the 12 water resources regions are summarized in table 9.

The backbone of the water-quality monitoring stations are the proposed 918 surface water and groundwater stations. The 819 stations dedicated solely for surface-water quality observations will be increased as the geographic locations of other operating stations become available and evaluation is made on the station's suitability for inclusion in the primary network.

The present integrated primary network is considered the initial rationalization of the undetermined number of stations operated by many agencies into a network aimed for effective and long-term water quantity and water-quality monitoring for a rational development and management of the water resources. With the growth of the network, experiences in the station operation, and the analysis and evaluation of data records, the primary network could be updated responsive to advances in technology, efficient network operation, and effective monitoring of the water resources.

Table 9. Primary network for water resources monitoring.

Water resources region	No./Name	Surface water ^a			Groundwater			Water quality		
		Existing	Proposed	Total ^b	Existing	Proposed	Total	SW/GW	WQ sole ^c	Total
I	Ilocos	9	4	13	0	22	22	35	136	171
II	Cagayan valley	32	3	35	0	73	73	108	46	154
III	Central Luzon	25	1	26	86	62	148	174	21	195
IV	Southern Tagalog	23	20	43	15	94	109	152	96	248
V	Bicol	14	2	16	11	24	35	51	134	185
VI	Western Visayas	14	5	19	5	32	37	56	30	86
VII	Central Visayas	8	7	15	0	47	47	62	29	91
VIII	Eastern Visayas	17	4	21	0	28	28	49	34	83
IX	Southwestern Mindanao	15	6	21	0	28	28	49	59	108
X	Northern Mindanao	24	1	25	16	20	36	61	110	171
XI	Southeastern Mindanao	18	7	25	0	28	28	53	108	161
XII	Southern Mindanao	28	4	32	0	35	35	67	16	83
	Total	227	64	291	133	493	626	917	819	1,736
Total 2001 network design		226	65	291	0	643	643	1,091	1,034	2,125

^aAll SW and GW stations are also water-quality monitoring stations, respectively operated by BRS and MGB.

^bOnly Primary Principal Stations of BRS are included in the integrated Primary Network.

^cStations solely for WQ observations - all EMB and MGB surface water stations.

Lessons Learned

Lessons - Establishing the Enabling Environment for IWRM

Social change: Stakeholders participation and empowerment, dialog and consensus

The days when government functionaries or contractors would suddenly arrive and start construction of infrastructural projects are effectively over. In economies with a fairly high level of democratization and active participation by the citizenry, the pace of investment and implementation has markedly declined but the sustainability of the completed facilities has dramatically increased. Projects have become smaller in size and scale but are more appropriate.

Political will

It is extremely important for the highest political leader to take an active hand in guiding and initiating sectoral reforms. A determined and informed leader can take the needed decisions to override and change existing structures and policies. The timely creation of special task forces and bodies to take immediate action while legislation is being enacted, and their subsequent normalization into the regular government machinery are examples of what political will can accomplish.

Value of International Cooperation

The active and serious participation of the Philippines in various international conferences and activities and the relevance of the issues and ideas discussed in these activities have played a role in the early acceptance of IWRM.

Impact of IWRM on the Poor

In *urban areas*, the poor benefit from integrated programs provided their participation is ensured and their rights are protected by land-tenure and resettlement measures. Demand-management programs should reduce wastage and cut down on low-priority uses, thereby making water available for redistribution to unserved communities if accompanied by targeted programs with this objective. The impact of coverage expansion to low-income communities on total demand for water can be expected to be marginal as their daily consumption is relatively low.

IWRM is very relevant to the lives of poor farmers and water users. If the price of water is increased to recover costs, or raised to limit demand, then without some mechanism for price support to poor farmers, there is a real danger of creating greater impoverishment. “Integrated”-ness generally increases benefits as well as costs. It would be prudent to assess closely who benefits and who pays and arrives at acceptable arrangements for sharing the additional benefits and costs.

In *rural areas*, measures to conserve and protect water resources intended for urban areas have the potential to disfranchise rural communities and impact on their livelihoods. This is particularly the case for watershed protection programs. As long as resource flows are not aligned with the allocation of economic costs and benefits, the economic valuation is of limited value as a policy tool. The definitions of property rights and of the institutional framework to handle related transfers are critical.

Lessons - Organizing Appropriate Institutional Roles for IWRM Implementation

Of the cases discussed, it is still probably too early to say (or we may never really be able to say) which institutional arrangement will be effective. Times change; situations change, interests change. The important lessons are the importance of a) agreement and consensus among the stakeholders, b) creativity and institutional capacity to deliver, c) the importance of financial autonomy so that the agency can make independent decisions, and d) having the correct scale (not taking on more than one can effectively manage).

Lessons - Applying Practical Management Tools for IWRM

The process of arriving at a water vision is significant not for the wisdom of the vision statement itself but for the process at arriving at a consensus.

Making IWRM Implementation More Meaningful and Effective

Areas for Policy Review, Research and Innovation

The National Strategy and Action Plan noted that further work was required before the economic pricing of raw water could be effectively adopted. More intensive study is needed about:

- The determination of the most appropriate and workable methodology for computing the economic price of raw water.
- The institutional arrangements for implementing the program.

- The impact of the charges upon the budgets of users and profitability of business including agriculture, and focusing on the poor, small farmers and marginal businesses.

There are substantial differences in concept, design and operation between water-supply schemes and irrigation canal networks. In general, the issues in irrigation are more complex because social, institutional and technical issues are strongly interlinked. Performance of irrigation systems is affected by cooperation among users. It is presently impractical to measure flows below the distribution canal heads, except for research purposes. Thus, charging farmers for the actual volume of water delivered is difficult. More research on charging through “proxy mechanisms” needs to be done.

Effective governance is important for effective water-resources management. With the advent of the LGC, the political landscape is gradually transforming. Already, one notices the new crop of professionals-turned-politicians applying their skill to provide basic public services. An essential role of the DILG is the identification of LGUs where such development changes can flourish and provide incentives. This points to the need for stronger partnership between NWRB and local government units in the future. The role of local governments has (correctly) been increasing and it would be very useful to explore institutional arrangements and sharing of responsibilities on water-resources management and regulation between these two levels of governance.

The use of market-based instruments through the Environmental User Fee implemented by LLDA seems to be very promising. A study of such other instruments applied to other sectors and the central regulatory agency would be useful.

Capacity Building Needs: Focusing on the Learning Process

As indicated in this report, many interventions to improve and build institutional capacity, including management and technical skills training, are underway. The important development need which can be strengthened really involves developing a critical and analytical eye to examine and assess situations, learn from them, formulate practical and of creative out-of-the-box concepts, ideas and innovations. This key element is likely missing from the numerous capacity-building programs.

Sri Lanka's Efforts in Introducing Water-Sector Policies and Initiating Related Institutional Development⁵

Introduction

Acceptance of the need for a more people-oriented and holistic approach to water management and development has gradually evolved as a result of a number of major international conferences. The Mar del Plata Action Plan of the UN Conference on Water in 1997, the Dublin Conference on Water and the Environment and the Rio Earth Summit in 1992 and the World Water Vision exercises in 2000 have successively reinforced the need for a comprehensive assessment of the world's freshwater resources, an approach featuring integrated water resources management (IWRM) as its basis.

Water is one of the most fundamental natural resources that Sri Lanka must harness in its quest for a rapid rate of economic growth. The role of water in the development process cannot be overemphasized. The demand for water has increased tremendously over the years in Sri Lanka and will continue to increase in view of the accelerating tempo of urbanization, population growth, industrialization and agricultural intensification.

The general objective of IWRM is to make certain that adequate supplies of water of good quality are maintained for the entire population of the Island, while preserving the hydrological, biological and chemical functions of ecosystems, adapting human activities within the capacity limits of nature and combating vectors of water-related diseases. Innovative technologies, including the improvement of indigenous technologies are needed to fully utilize limited water resources and to safeguard those resources against pollution and depletion.

Past Policy Initiatives for IWRM

Sri Lanka's challenges in water-resources management include seasonal shortages of water for irrigation, domestic use and hydropower generation as well as degradation of the quality of surface water through domestic and industrial effluents and agricultural runoff. Hence, during the past several decades the Government of Sri Lanka has made several attempts to institutionalize a coordinating mechanism amongst the plethora of sectoral agencies in the water domain to resolve the water-allocation issues. The competitive and consumptive-user agencies fell within the purview of independent and separate ministries concerned with Land, Mahaweli, Energy and Urban Utilities.

Since the early sixties several attempts have been made for institutional reform in Sri Lanka's water sector. In 1964, the Water Resources Board was established to advise the minister responsible for irrigation on water management issues, such as the formulation of national water policies, integrated water-resources planning, river-basin and trans-basin development coordination and project coordination in general and the prevention of water pollution. Despite its mandate, the Water

⁵Prepared by V. K. Nanayakkara, Secretary, Ministry of Human Resources Development and former Chairman of Water Resources Council, Sri Lanka.

Resources Board has not functioned as a water-management advisory body. At present, it carries out hydrogeological investigations and the development of groundwater through the drilling of tube wells. In 1980, a Water Resources Bill was drafted by the Ministry of Irrigation, Power and Mahaweli Development. This draft legislation made provision for bulk water allocation to various sectoral agencies (and further allocation by those agencies) and for the establishment of a National Water Resources Council as an advisory body under a “minister in charge of water resources planning.” However, the legislation was never submitted to Parliament due to a lack of Cabinet support.

With the formal approval of the policy of “Participatory Management of Irrigation Systems” in 1988, the government called for substantial devolution of authority and responsibility to farmer organizations. In order to facilitate the implementation of this policy, the Irrigation Management Policy Support Activity (IMPSA) was designed and implemented by the International Irrigation Management Institute (IIMI) with USAID assistance. It executed a systematic and analytical planning process to assess experiences and formulated policies and guidelines for implementation of the new irrigation management policy. The outcome of IMPSA was expected to be a broadly participatory activity involving a wide range of stakeholders including specialists, policymakers, irrigation managers and farmer representatives with an emphasis on achieving a broad consensus on future directions. The project highlighted the need to address competing demands for water in the light of limitations of available water resources. IMPSA was initiated by the Ministry of Lands, Irrigation and Mahaweli Development and the Ministry of Agricultural Development and Research.

In its 1992 summary report IMPSA made recommendations on land, watershed and water-resource management. That report recommended that the government should establish a high-level, advisory National Water Resources Council and Secretariat. The functions of the proposed Council would include the development of a national water-resources policy and law and a national water-resources master plan. The IMPSA report also recommended “a comprehensive water policy that looks at water in a holistic way, to put water to the most beneficial use at the least cost, as to conserve it without degrading the environment, sustaining it for future generations as well.”

A proposal to carry out a water resources master plan was presented to external support agencies in 1992. As a result, in late 1993, the Asian Development Bank funded the “Institutional Assessment for Comprehensive Water Resources Management (IACWRM) Project” to assess the institutional capacity for water-resources management. Its outcome was a strategic framework and an action plan for comprehensive water-resources management. This action plan focused mainly on the need to develop a National Water Resources Policy, to establish a permanent institutional arrangement for water-sector coordination, prepare and enact “The National Water Act” and amend other related legislation, establish a system to provide information and data to decision makers and carry out comprehensive planning in selected watersheds. The Technical Assistance (TA) included broad consultation with the government agencies, water-related private-sector groups and NGOs and other donor agencies. A strategic framework and an “Action Plan for Comprehensive Water Resources Management” were drawn up to establish the improved institutional framework over a 3-year period. The project recommended the formation of a temporary Water Resources Council (WRC) for a period of 3 years to oversee the implementation of the Action Plan and to recommend permanent institutional arrangements for water-resources management. Concurrently, the second TA project funded by ADB, “Institutional Strengthening for Comprehensive Water Resources Management” and FAO/Netherlands-funded “Water Law and Policy Advisory Programme” were developing water legislation and assisting groundwater policy development. On the basis of these recommendations, in 1995, the national Cabinet approved the implementation of the Strategic Framework and Action

Plan for the “Institutional Strengthening for Comprehensive Water Resources Management” (ISCWRM) project. As a result of these recommendations, the Government of Sri Lanka established a Water Resources Council (WRC) and a Water Resources Secretariat (WRS) in 1996. The Asian Development Bank approved funding of the project over a 30-month period beginning in April 1996. Parallel funding for legal and policy assistance was provided under the FAO/Netherlands “Inter-Regional Water Law and Policy Advisory Programme” over approximately the same time period.

These projects resulted in producing the “National Water Resources Policy and Institutional Arrangement” and the “National Water Resources Authority Bill.” The National Water Resources Policy was approved by the Cabinet of Ministries in March 2000 and the draft National Water Resources Authority Bill was released by the legal draftsmen’s department in September 2000. However, this was subsequently revised on comments given by the Water Resources Council; the present available document is the fifth revision of the National Water Resources Authority Bill. Subsequently, the policy was revised due to public concerns expressed on certain sensitive issues and the revised Bill is due to be submitted to the Cabinet of Ministers for approval. According to the current work plan, the National Water Resource Authority Act should be approved in parliament and the National Water Resources Authority established by June 2003.

Critique of the National Water Resources Policy

The Water Resources Secretariat established by the National Planning Department of the Ministry of Finance and Planning serving under the guidance of the Water Resources Council produced the national water resources policy and institutional recommendations. The Cabinet of Ministers approved this national policy document on 28th March 2000. Based on the approved policy, a draft water resources bill was prepared by the Legal Draftsman. However, the approved policy was widely criticized by the media, by the NGOs and by elected representatives of political parties. Public agitation against the proposed policy and institutional arrangements was widespread. Yet, the public understanding and perceptions are surrounded by myths and fallacies, some of which are discussed below:

“Ownership” of Water

The principle enumerated in the policy statement that all water resources, including both surface water and groundwater, are owned by the state and will be managed by the government in partnership with water users on behalf of all Sri Lankans has drawn much criticism.

It is contended that the corollary of the “state becoming the owner of all water” is a move by the government to price the resource and thereby acquire the right to sell water. In fact, this right will force people to obtain a license (user fee) to dig a domestic well in their private compounds as groundwater is owned by the state! This is merely the initial step in a concerted effort to discourage the farming community of their livelihood!

Unfortunately, the controversy surrounding the use of the term “owned by the state” permitted a misconstruction of the policy, which would have been best avoided. Ownership connotes a right to prevent others from using a “resource.” Yet water is a common property resource which is always in a state of flux. In the course of its movement in the hydrological cycle it can only be owned

when captured in a receptacle. It is best defined as a common property resource, not a public property and hence incapable of being owned. This will at least avoid a possible controversial interpretation.

Water Entitlements

The policy document in Section C2 describes the water allocation policy as follows:

- 2.1 Water use rights will be granted through water entitlements. Water entitlements will be granted to group schemes (urban water systems, irrigation schemes, etc.) and larger water users. Small-scale users and individual users supplied through group schemes will be exempt from the requirement to hold an entitlement. “Small-scale” use will be defined through further investigation, pilot testing and consultation with water users.

Water entitlements will be used to convey water use rights for both surface and groundwater. No government agencies or categories of water users will have an automatic right, on the basis of other legislation, to use water without an entitlement.

As an interim measure, public irrigation agencies, such as the Irrigation Department or the Mahaweli Authority will hold water entitlements on behalf of farmers. In turn, water will be delivered to individual farmers under a delivery agreement, which will form the individual’s water right. Where farmer organizations or farmer companies are formed or aggregated at system level and are legally qualified they may also hold water entitlements.

- 2.2 Water entitlements will contain terms and conditions regarding water abstractions. Terms and conditions will include such things as the purpose of water use, the volume, rate and source and point of abstraction (source: National Water Resources Policy and Institutional Arrangements-April 2000, p.15).

It is feared that the introduction of this section will cause changes to the traditional water-use pattern and that the current users will be required to pay a user charge. Under the proposed Bill, all users of water sources in the country, including government agencies such as the Ceylon Electricity Board (CEB), the National Water Supply and Drainage Board (NWSDB), the Mahaweli Authority of Sri Lanka (MASL) and the Irrigation Department will have to obtain a permit for withdrawal and use of water. In the proposed system where bulk water allocations by the state National Water Resources Authority (NWRA) is contemplated, the possibility of hydropower, industrial and hotel investors getting priority over paddy cultivation is not ruled out. What is meant by “bulk withdrawals” is not defined. Hence, a clear distinction of a “reasonable of use of water” must be made to exclude any withdrawal of water by means of nonmechanical means. The section on Water Rights, Allocations and Entitlements should be rewritten to prevent any ambiguity.

Transferable Water Entitlements

This is the most misunderstood section in the proposed policy. The national policy stipulates that the security of supply for water users will be increased through a system of water entitlements, which are effectively monitored and entered. While the establishment of formal, transferable water entitlements would promote water conservation, water users who will have the option of buying or

selling water rights will recognize the value of the resource and will have a direct incentive to improve its use.

Section C7 of the Policy document states:

- 7.1 Voluntary transfer of water entitlements will be allowed between entitlement holders or from entitlement holders to those seeking to acquire water use rights. Transfers will not be restricted on the basis of the purpose for which the water is used.
- 7.2 Transfer of entitlements will be allowed between similar or different types of water users (within or between water-use sectors) on a temporary or permanent basis. Transfers will normally involve compensation paid by the new holder of the entitlement to the original holder.
- 7.3 Water entitlement holders will be free to transfer their entitlements as long as the transfer does not negatively affect the water rights of others. Decisions on water-entitlement transfer applications will be made by the National Water Resources Authority on the basis of clear and publicly available guidelines.
- 7.4 Guidelines regarding water entitlement transfers will specify the maximum proportion of a water entitlement which may be transferred and other conditions or controls which may be necessary. A portion of a water entitlement may be restricted from transfer in order to protect such uses as incidental domestic use, water supply to disadvantaged groups or alternative agricultural uses. Guidelines will be approved by the River Basin Committee.
- 7.5 When land for which a water entitlement is in effect is sold, the new owner will be assumed to take over the water entitlement (source: National Water Resources Policy and Institutional Arrangements April 2000, p.17).

The main criticism is that this policy seeks to make the peasant's right to water (now defined as entitlements) also "transferable." What is even more dangerous than a system of entitlement certificates is the room left for the permits to be sold out. A scenario where the farmer associations lack the funds to buy the permits, the likelihood of private companies buying the permits and selling the water to the farmers looms large (Shakunthala Perera, Daily Mirror, Nov. 20, 2000).

Further, this provision will pave the way for multinational companies to buy the water entitlements from farmers, thereby threatening the food security of the country. It is further argued that a free transfer of water entitlements between private parties for a fee is not acceptable as this will make water a tradable commodity. This would result in a further impoverishment of small farmers already at a subsistence level. A parallel had been drawn with the arrangement to give title to the lands of small farmers under *Jayabhoomi* and *Swarnabhoomi* schemes to enable them to use such lands as collateral for loans from the banks. It is alleged that what it sought to be done was to make the land "transferable" or saleable (Gamini Seneviratne, The Island, Dec. 14, 2000).

Water Pricing—Water Tax

The sections that deal with the principle of cost-sharing and demand management have led to wide misinterpretation giving rise to a fear that the policy document attempts to make water a saleable commodity. The national policy lays down the principle that the costs of water-resources management will be shared in an equitable manner with beneficiaries.

This provision for cost recovery is a prelude to impose a water tax and allegedly it is nothing less than a maneuver to get the Sri Lankan peasant off the land! This misunderstanding arises mainly due to aborted past attempts at beneficiary cost recovery for irrigated water and attempts at full cost recovery for drinking water. These sectoral efforts will be discussed in a subsequent section on policy. By the phrase “sharing of costs of water-resources management” what is understood is the defraying of costs of an NWRA, WRC and a Tribunal and not the cost recovery in consumptive use. It is best for three apex-level administrative/judicial entities to be funded by the government budget in order to avoid a possible controversy so that the process can be carried forward.

As the document points out there is at present virtually no price paid by anybody big or small for water, except for piped urban water supply, of which the National Water Supply and Drainage Board is the largest supplier. Here too the consumer is paying only a fraction of the cost of purified piped water. Efforts to introduce a water tax for farmers have failed. The *jalabadda* introduced in the 1980s was unsuccessful. Now the strategy is to get farmer contribution for maintenance of the systems. The irrigation sector uses about 90-95 percent of the artificially collected water or withdrawals (this operates mainly in the dry zone where irrigated agriculture is the norm) and there is a perception that this could be reduced.

The irrigation sector is very important, as the food security of this country which is measured in terms of paddy production, is dependent on it. Over 90 percent of all the country’s needs of rice are being met at present and there should be no reduction of rice production or pressures applied to move farmers on to other field crops (OFCs) by charging for water use. Also, other crops have market limitations and thereby producers could be pushed to poverty. In addition, the market limitation will limit the diversification and thereby limit the water savings. As such, the expectation of the policy to save water through crop diversification will not materialize. Such policies are best left to the sectors concerned to evolve suitable strategies.

Water—A Saleable Commodity

The proposed Bill, which will give effect to the national policy will empower the NWRA to value freshwater based on the concept of “water as a commodity,” register and develop natural groundwater resources within the entire country, make an inventory of groundwater resources, and recognize the state having a saleable right to any such water (Dilrukshi Handunnetti, Sunday Times Nov. 19, 2000).

From time immemorial, agriculture has been given pride of place in Sri Lanka. M.K. Jayatissa of the all Lanka Peasants Congress states that World Bank [*sic*] recommendations clearly state that water should be made a property and distributed with a price tag (quoted in Poorna Rodrigo, Farmers face water worries, Daily Mirror, Nov. 14, 2000).

The reference in the document that Local Authorities are encouraged to register domestic wells has drawn considerable opposition. The recommendation was made with the best of intentions to

protect the health of the people who depend on dug wells which are close to cesspits. This provision to prevent fecal contamination of well water may again be left to the public-health authorities.

Sector Policies

Overall Policy for Water

The annual renewable freshwater resources in Sri Lanka amount to 2,341 cubic meters per capita. However, recent studies undertaken by IWMI reveal that aggregate figures mask the significant spatial and temporal variations in water supply and demand (UNEP, State of the Environment, Sri Lanka 2001, 12).

Since water is largely a common property resource, the water policy in Sri Lanka has always been synonymous with government policy. Policy pronouncements in water have been fragmented, ad-hoc and sectoral and not conducive for a comprehensive view of the “domain” of water. It is deliberately referred to as a “domain” to distinguish the overall resource from the sectors such as irrigation, domestic water and hydropower, etc. Further, each sector has major subsectors. Irrigation may comprise major and minor irrigation. Drinking water has subsectors such as urban, peri-urban, rural and community for which separate subsectoral policies have been developed.

In the all-embracing area of “water,” there is a lack of a necessary mechanism for overall policy formulation at the apex level and a lack of appropriate policy dialogue. The domain of water comprises two main sectors as far as consumptive use is concerned. They are a) irrigation and b) drinking water and sanitation. The expansion of infrastructure has been the dominant policy consideration in the past in both these sectors, since the main problem was assumed to be lack of infrastructure and finance to increase the supply of water. It was also assumed that water should be supplied free of charge to the population. Basically the thrust of water-resources policies has shifted from a predominantly sectoral and technical approach towards more integrated approaches, which take account of socioeconomic, environmental and institutional issues. A particular feature during the last few decades has been this dynamic of policy development which recognized that the traditional sectoral approach was not addressing the major problems they were facing in the management of water resources.

What are the options for addressing the major issues of water allocation amongst the competing users in the coming decade? We can substantially restructure the current status by using government powers to regulate bulk withdrawals; alternatively, we can largely maintain the existing system and permit the government and private agencies to withdraw water freely as they do now.

In Sri Lanka, the national water policy advocates a holistic and an integrated approach based on a watershed/catchment concept for the management of water resources. It seeks to introduce a consolidated policy on water that integrates the development and management of this vital resource, which has hitherto been the subject of major sectoral reform and not overall reform.

Policy Reforms: Irrigation Sector

Irrigation is the single largest water user in Sri Lanka. The policy documents on sustainable irrigated agriculture underline the major contribution of irrigated agriculture to food security and emphasize the need to plan, design and manage natural resources for irrigated agriculture in such a way that

adverse environmental effects are avoided. Priority is given to improving water management, starting at the farm level. With paddy farming producing declining returns, the shift to more water-efficient, high-value crops and even transfer to other more productive sectors may be encouraged.

The policy initiatives of the recent past indicate the acceptance by the government of the need for participatory management in irrigation, schemes with the objective of imposing overall management and performance and bridging the gap between the financial resources required for successful O&M of the system and the amount of such resources that the government can afford to provide. The management principle in village tanks was adopted in respect of the distributary and field channels, encouraging farmers to manage the O&M of the distributary systems by contributing their labor and other sources so that they can be exempted from payment of irrigation fees.

A major consensus that has emerged is the contraction of the government's role in irrigation management and the corresponding role of water users. The government has agreed that farmer organizations will take over the tertiary system for O&M on condition that a) the government operates and maintains the main canal system, b) through a system of project and sub-project committees, the farmer organizations will participate in decision making and management of the whole system, and c) the government extends the required technical assistance and even financial assistance in extraordinary situations such as a major flood damage.

Cost Recovery in Irrigation

In reviving irrigated agriculture to benefit the peasantry, the Irrigation Ordinance of 1906 introduced schemes for repayment by the beneficiaries for improvements to irrigation works. During the post-independence period this practice declined while the service provider role of the government increased. Despite the introduction of nominal irrigation rates for lands which received irrigation water, the rates of recovery declined sharply. Cost recovery had never been a priority for irrigation agencies except to satisfy the covenants of donor-credit agreements.

The sociopolitical climate is not conducive to reintroduce a charge for irrigation water. The low profit margins of the majority of the small farmers using irrigation water do not allow them to absorb the cost of water. On the other hand, it is essential that the gap between the financial resources necessary to operate and maintain irrigation systems and the amount of financing which the government can afford should be bridged. The only practical way of ensuring a sustainable irrigation network appears to be the proper implementation of the system of joint management of major irrigation schemes. Minor irrigation schemes should be turned over to the beneficiaries for "self-management" with O&M of the schemes undertaken at their own expense.

Policy Reforms: Water Supply Sector

The overall policies and strategies in the water-supply sector emanate from the need to improve access to safe drinking water. The policy reforms suggested in the water-supply sector such as the attempt to introduce private-sector participation in the management of supply systems and the principles of cost recovery were misunderstood and misquoted by the media when the IWRM attempted to introduce its policy package comprising water entitlements and demand management. Hence, the policy reforms suggested in the water-supply sector are dealt with in this section. Much of the media and public criticism of the national water-resources policy was based on a mix-up

with the water supply (drinking water) policy initiatives where PSP and cost recovery were at an advanced stage.

The Government of Sri Lanka had set a goal of providing access to safe potable water and basic sanitation to all its citizens by the year 2010. In order to achieve this goal, a clear and coherent policy had to be formulated and implemented with the consensus of all stakeholders in the sector.

The following loan covenants were the subject of agreement by the Ministry in charge of water supply with the multilateral donors. First, the NWSDB will meet all O&M costs, plus the greater of the debt service or depreciation from revenues derived from tariffs. Additionally, every water-supply scheme will meet at least its own O&M costs from its tariffs. The cross subsidy from nondomestic to domestic water consumers will be reduced from an earlier ratio of 6:1 to not greater than 3:1 by the year 2000.

Additionally, a separate sewerage tariff to cover O&M costs of the sewerage systems had to be introduced in three phases commencing in January 2000 and ending in January 2002. By January 2000, a water and wastewater-regulatory system was to be established to review, adjust and approve water and wastewater tariffs. Further, by January 2000, the borrower would have established policies and procedures for the determination of water rights and the allocation of water, particularly with respect to the competing uses of water for domestic, irrigation and hydropower uses and for groundwater use. Also, the government had agreed to establish some form of private-sector management for the Greater Colombo Water Supply and Sewerage by 2001.

A shift towards more and more user-managed modes of providing facilities and services is required. Further, conceptual and attitudinal changes in all sector partners are imperative focusing on water as an economic good and a commodity responding to effective demand. Concurrently, the capacities and the resources of the user organizations and those of the private sector need to be utilized more productively while the role of the government, particularly in the provision of facilities had to be reduced. This could encourage wider participation, optimum utilization of the latent potential outside the government while contributing to making such facilities and services economically viable and minimizing the dependence on the government.

Independent Regulator

An independent regulator will be established to protect the interests of the consumers and will have jurisdiction over both public and private providers of water. The regulator will consist of a board of qualified persons who will be empowered by law to:

- Set tariffs based on government policy and service-cost levels.
- Ensure that operators carry out their legal responsibility under contract with the State.
- Insist on standards of quality and service with appropriate penalties.
- Promote high standards of efficiency.
- Deal with complaints and settle disputes.

Independent regulation is necessary to ensure a level playing field for private investors in a monopoly service. Further, it ensures that the service is provided at the agreed standard and reliability; the charges are reasonable, the customers' interests are protected. It is best set up through

enabling legislation, which should provide for essential safeguards, such as a transparent selection process, qualification and disqualification criteria, financial autonomy, fixed tenure and criteria for removal. The regulation should be a public body able to maintain an independent position far removed from political or partisan pressures.

Potable water is a monopoly service and supply does not experience any natural pressure to restrict their charges to meet competition. Economic regulation is therefore needed to stand in place of the market forces that would apply in a commercial, competitive market.

Cost Recovery in Water-Supply Systems

The whole question of water charges in the drinking water sector must be put in perspective. There remains a certain terrifying logic behind the assertion that it is the government's responsibility to provide water to every citizen at state expense. Does a human right to water imply a right to an unlimited amount of water at no cost? What does the government provision of water mean? Who bears the cost? There is a need for a principled and objective approach to cost-sharing in respect of the supply of drinking water. A first step toward meeting a human right to water would be for governments to guarantee all humans the most fundamental basic water needs through management strategies such as water entitlements.

The poor cost recovery by a utility really means that all the inhabitants of the country, regardless of the benefit of a water service are compelled to contribute to maintain the mostly urban water-supply schemes. Is this fair? Admittedly, the direct beneficiaries should bear at least the O&M costs, and probably the capital costs of construction and rehabilitation. As for irrigation water too, it is best to charge the true cost of the resource and compensate the impoverished peasant through a targeted support system for the poor. To put it simply, where the full cost of water is not recovered from the user/beneficiary of that service then somebody has to meet the expense. The popular saying that the government must bear the cost really means that a localized service is paid for by all sections of the population, including the poor. The popular belief that water is god-given (*vassa valahaka deviyo*) is a misconception and that its supply should probably be free is no longer tenable. There is a cost of carriage of water, cost of treatment and cost of distribution. Additionally, there is certainly a cost of depletion of stream flow. When the service fails, the consumers suffer.

IWRM is based on the perception of water as an integral part of the ecosystem, a natural resource, and a social and economic good, whose quantity and quality determine the nature of its utilization. To this end, water resources have to be protected, taking into account the functioning of aquatic ecosystems and the perenniality of the resource, in order to satisfy and reconcile needs for water in human activities. In developing and using water resources, priority has to be given to the satisfaction of basic needs and the safeguarding of ecosystems. Beyond these requirements, however, water users should be charged appropriately.

Financing Drinking Water Infrastructure

While the abstraction and use of water require various scales and types of investment and generate different types of benefits, there is a growing consensus that a substantial proportion of costs needs to be recovered from those who benefit. Usually, a distinction is made between capital investment and recurrent costs.

What are the implications of a failure to match prices for delivery of water? Drinking water prices are deliberately kept low with the argument that the poor could not afford water at cost-recovery prices. Yet, the truth is that the government-subsidized water mostly benefits the relatively

affluent sections as opposed to the poor who are not connected to the pipe-borne supply systems. Isn't it an irony that people of lower Uva who do not enjoy the luxury of pipe-borne water contribute to Colombo living because the government has to meet a part of the costs, not charged to the direct beneficiary. The opportunity cost of that capital is a foregone school or a hospital service somewhere in the country.

Tariffs for water abstraction should be a function of the kind of use and the relative scarcity of the resource. Levies for wastewater discharges may depend on the pollution loads and the use of vulnerable receiving water bodies.

Investment Needs and Private-Sector Participation

The government's annual capital expenditure for the domestic water-supply sector has ranged from about Rs 2.5 billion to Rs 4 billion, equivalent to about 0.5 percent of the GDP. Construction of new schemes accounts for about 60 percent of this expenditure with the rehabilitation and improvement of existing schemes. The funds needed in the water-supply sector to the year 2010 have been estimated by the National Water Supply and Drainage Board at Rs 85 billion. The funding available for the water sector from the central government over the next 10 years amounts to a total of Rs 45 billion due to constraints placed by the capacity for public borrowing. This is around half of the funds needed by the sector.

In order to meet the investment gap and also to access long-term multilateral funds designated to the private sector into Sri Lanka, private-sector investment in water supply has been promoted. The NWSDB finances its capital investments from a mixture of government grants and the proceeds of foreign loans.

Under policy reform for the drinking water sector, the private sector is invited to enter into partnership with the government to operate, maintain and extend water systems. This Public-Private Partnership can take many forms including the following:

- *Service contracts*, where the public authority retains responsibility for O&M of the system and limited scope services are contracted out or outsourced with payments to the contractor being linked to performance targets.
- *Management contracts*, where the public authority transfers the responsibility of the entire O&M of a system to a private company. The public authority will undertake capital investment and funding of the operations while payments to the operator will be based on a fixed fee and incentives for increasing efficiency.
- *Lease/concession contracts*, where the private operator rents the facilities from the public authority and is responsible for the O&M including investing in the system on an agreed basis to ensure desired coverage. The operator needs to be ensured of a reasonable return on investment and should be motivated to increase efficiency.

All major fixed assets presently belonging to the water schemes are expected to remain with the government. As private investment in water-supply schemes would need to establish an adequate rate of return on the project, it is anticipated that government resources will be targeted to make water affordable and increase accessibility by providing government subsidy to cushion tariff levels. The private sector will be invited into a partnership through transparent, open competitive bidding procedures.

The government believes that the private sector can help close the funding gap. Whilst PSP is in its infancy in Sri Lanka, it is virtually nonexistent in the water-supply sector. However, the policy acceptance has gradually emerged that the management of (drinking) water-supply systems would not remain entirely in the hands of central public agencies. It is very important to distinguish between the policy reforms in the Water Supply and Sanitation (WSS) sector that promotes PSP with the National Water Resources Policy.

Public Water Allocation

There is an essential role for the government (public allocation) in the development and management of water resources. Public allocation is seen in the majority of large-scale irrigation systems, where the state decides what water resources can be used by the system as a whole, and allocates and distributes water within different parts of the system. Public allocation of water has usually been associated with water quantities, based on physical norms and political influence.

In the domestic water sector, both urban and peri-urban and many rural water supply and sanitation programs require public-allocation mechanisms. Public allocation also dominates industrial water requirements for water withdrawal and effluent discharge by individual companies and industries. Although hydropower is a nonconsumptive use, it requires public-water allocation through decisions to build dams and the operating rules that change the flow patterns of rivers. Public allocation to fisheries, tourism, wildlife, and transportation may require future consideration in the development or withdrawal of water for other uses.

The state's role is particularly strong in inter-sectoral allocation, as the state is often the only institution that includes all users of water resources, and has jurisdiction over all sectors of water use.

Institutional Context

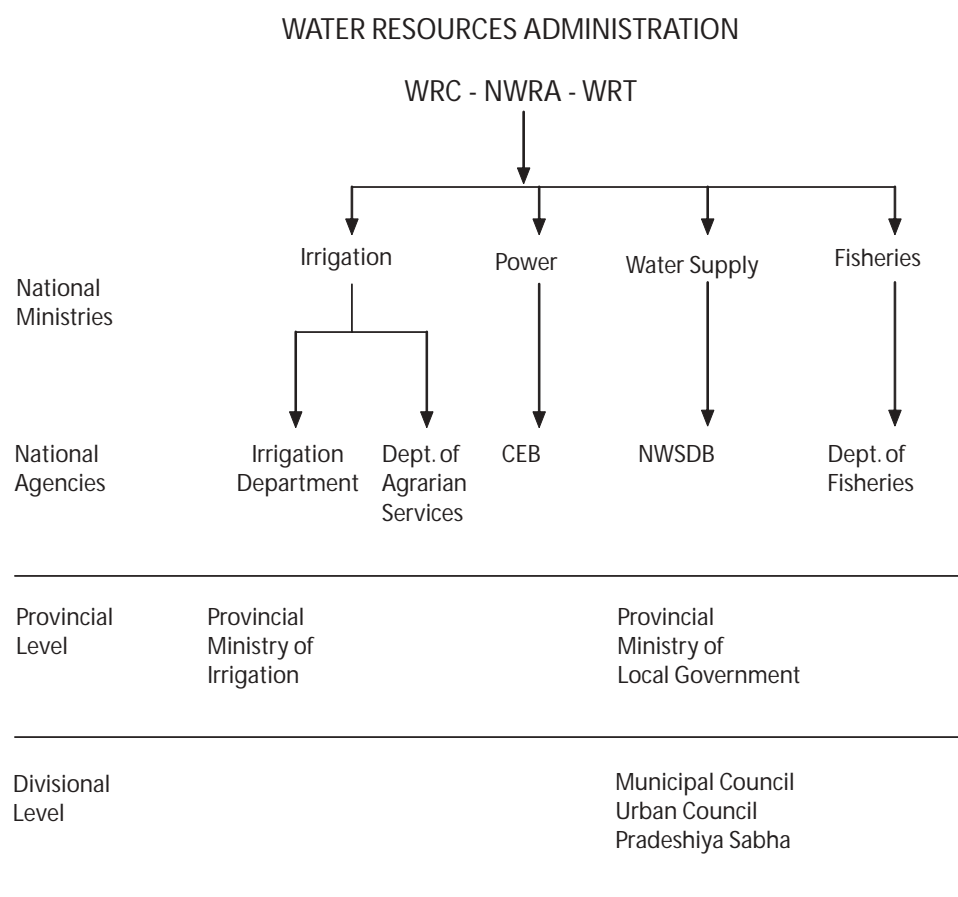
The widespread seasonal and spatial scarcity, gradual destruction and aggravated pollution of freshwater resources in many parts of the Island, along with the progressive encroachment of incompatible activities, demand integrated water resources planning and management. Such integration must cover all types of interrelated freshwater bodies, including both surface water and groundwater, and duly consider water quantity and quality aspects. The multi-sectoral nature of water resources development in the context of socioeconomic development must be recognized, as well as the multi-interest utilization of water resources for water supply and sanitation, agriculture, industry, urban development, hydropower generation, inland fisheries, transportation, recreation, low and flat lands management and other activities. Rational water-utilization schemes for the development of surface water and underground water-supply sources and other potential sources have to be supported by concurrent water-conservation and wastage-minimization measures. Due attention, must be accorded to flood prevention and control measures, as well as sedimentation control, where required.

The institutional framework of the water sector in Sri Lanka is complex. Figure 1 depicts the key agencies in the national framework. The National Water Resources Authority (NWRA) sits at the top of the hierarchy covering the entire domain of water. The new water-resources administration

at the apex of the national level seeks to address water-resources management gaps and the fragmented mandates of the existing sectoral agencies. This administration comprises three entities, namely, the Water Resources Council (WRC), an NWRA and a Water Resources Tribunal (WRT).

In order to discharge its national mandate, the NWRA has to be located in the government structure, with direct responsibility to the Chief Executive in order to ensure perceived neutrality amongst the water-user sectors. Its current location in the Ministry of Irrigation and Water Resources, defeats this purpose. The subnational administrative arrangements brought forth by the Thirteenth Amendment to the Constitution of Sri Lanka further complicates water-resources administration. The devolution of powers to a Provincial Level cuts across the river basins, which radiate from the central hills. For the sake of IWRM, watershed is the ideal planning and executing agency.

Figure 1. Institutional situation.



Besides the creation of new institutions, the mandates of existing sectoral agencies need to be reexamined in order to sharpen the regulatory role of the government. Institutional roles and responsibilities remain unclear and partly overlapping. Several recent studies had reiterated the most essential issue, namely, the need for separation of powers in agencies, policymaking and regulation on the one hand, and implementation/operation/ ownership/service management on the other. For instance, the NWSDB undertakes several key functions as a regulator, a planner, a designer and implementer and as an operator of the water-supply systems with consequent conflict of interests

and a lack of clarity of purpose. In a reformed Water Supply Sector, what should be the NWSDB's role?

Within its overall objectives, the Board undertakes several key functions comprising:

- *A regulation role*, in monitoring its own physical and financial performance; physical performance in terms of the service levels provided to customers - reliability, water quality, and pressure; financial performance within the tariff limits agreed by its parent Ministry.
- *A planning role*, at both the macro and the individual scheme level where projects are identified within specific planning criteria.
- *A design and implementation role*, where individual projects are identified, evaluated, designed and constructed. These projects may be externally funded or promoted by the government. Construction is usually carried out by contractors with the Board responsible for contractual supervision.
- *An operational role*, in the O&M of water-supply systems.

A large number of institutions are engaged in the use and management of water resources. The following is a listing of national-level agencies that handle various aspects of the management of water resources.

- Irrigation Department
- Land Commissioner's Department
- Sri Lanka Land Reclamation and Development Corporation
- Department of Agrarian Services
- Department of Agriculture (Soil Conservation)
- Forest Department
- Water Resources Board
- National Water Supply and Drainage Board
- National Aquatic Resources Agency
- Coast Conservation Department
- Fisheries Department

A multiplicity of institutions is sometimes unavoidable. Water resources, by their very nature are cross-sectoral, whereas administrative arrangements of the government are based on the sectoral approach.

A complicating issue is the slow progress on implementation of devolved responsibilities. The ability of Provincial Councils and Pradeshiya Sabhas to assume in practice their statutory

responsibilities has not been much supported. A development of considerable significance in recent years is the establishment of a large number of NGOs with the primary objective of the protection of natural resources. In a few areas, such as the Community Water Supply and Sanitation Project (IDA credit), demand-driven community-based rural water projects have been successfully executed. The Community-Based Organizations that manage these rural schemes now seek legal recognition.

Institutional User Conflicts

As water is in short supply, the resource harbors a considerable potential for conflict. These conflicts may occur between community groups or individuals who require water for drinking or for cultivation or for commercial and industrial purposes. While the irrigation sector's head-end-tail-end problems are notorious and the conflicts are resolved at *kanna* (cultivation) meetings, in respect of conflicts between drinking or cultivation purposes there is no arbitrator.

There is an acute competition for limited water resources in Sri Lanka. This is evident in Anuradhapura between the urban dwellers and the rural farmers. The current proposal for drinking water for Anuradhapura is to abandon the existing nearby water-supply source, i.e., Nuwara Wewa, to farmers for irrigation, and to go to a more distant water source in Turuwila increasing the cost of production of drinking water, having to haul water over a longer distance.

Moreover, the farmers at Nuwara Wewa oppose sharing any water with the drinking water authorities. As a result, the government ordered the Mahaweli Authority to release water for the farmers. Nuwara Wewa caters to at least 800 farmers with 2,800 acres of paddy-land and 360 acres of highland. The farmers near Anuradhapura, to whom land titles were given in 1943 with the assurance of water, have suffered from gradually deteriorating access to water for their fields over the last 10 years. Paddy cultivation has already run at a loss for some time. The 51 households residing at the tail end of the irrigation canals from the Nuwara Wewa receive very little water from the tank and it is not adequate for their agricultural purposes. They have had to resort to irregular wage-labor and to subsistence crops. This case illustrates the conflicts of water use for drinking and food production. Such competition is likely to increase with the expected increase of the urban population to over 35 percent of the total population by the year 2010.

Role of the Government

In creating the enabling environment for lowest-appropriate-level management, the role of the government includes mobilization of financial and human resources, legislation, standard setting and other regulatory functions, monitoring and assessment of the use of water and land resources, and creating of opportunities for public participation. International agencies and donors have an important role to play in providing support in creating the required enabling environment for IWRM.

IWRM, including the integration of land- and water-related aspects, should be carried out at the level of the catchment basin or subbasin. Four principal objectives should be pursued, as follows:

- To promote a dynamic, interactive, iterative and multi-sectoral approach to water-resources management, including the identification and protection of potential sources of freshwater

supply that integrates technological, socioeconomic, environmental and human health consideration.

- To plan for the sustainable and rational utilization, protection, conservation and management of water resources, based on community needs and priorities with the framework of national economic development policy.
- To design, implement and evaluate projects and programs that are both economically efficient and socially appropriate within clearly defined strategies, based on an approach of full public participation, including that of women, youth, indigenous people and local communities in water management policymaking and decision making.
- To identify and strengthen or develop, as required, the appropriate institutional, legal and financial mechanisms to ensure that water policy and its implementation are a catalyst for sustainable social progress and economic growth.

The Way Forward

It will be necessary for Sri Lanka to receive further support from external support agencies in order to carry the process forward as the central coordination function in the water domain has not yet been achieved. As the foregoing survey reveals, over the past few decades, there has been an increasing acceptance that the management of water resources must be undertaken with an integrated approach, that assessment of the resource is of fundamental importance as the basis for rational decision making and that national capacities to undertake necessary assessments must be fully supported. Management decisions to alleviate poverty, to allow economic development, to ensure food security and the health of human populations as well as preserve vital ecosystems, must be based on our best possible understanding of all relevant systems.

What would be the feasible options to help take the IWRM process forward? We suggest the following actions:

Guidelines for Priority Use

First, guidelines for priority need to be established through a process of documentation of the user conflicts. The intensive competition for water between irrigation use for food production by the farmers and domestic use for drinking and personal hygiene by both the urban and rural consumers needs urgent resolution. This can only be achieved by agreeing on a set of guidelines for conflict resolution to be implemented by a nonpartisan body such as the NWRA. The guiding principles for such water allocations, particularly under water-stress situations, as during a period of drought need to be backed by appropriate legislation. Currently, there is a “free-for-all” situation where the contending sectoral interests are resolved by means of greater “political” clout. Formulation of appropriate legislation setting out the principles of “priority water allocations” needs to be based on socioeconomic, financial, environmental, technical and political considerations.

Case studies which illustrate the competing rights for limited water must be documented and analyzed in order to formulate policies and procedures to be enacted, which would assist in resolving

such issues. A case in point is the Anuradhapura water-supply scheme, which brings into sharp focus the conflicting situation in executing sectoral mandates.

Definition of “Reasonable Use”

A system of “water entitlements” will fail if the categories of “reasonable use” are not defined in the legal enactment. Rights to abstract and use surface water and underground water are based on two principles, which should be modified to suit Sri Lanka’s situation. These are the doctrines of riparian rights and prior appropriation.

The riparian doctrine gives the occupier of land bordering a stream a right to make a reasonable use of water and imposes liabilities on upper riparians who unreasonably interfere with that use. The reasonable use should be defined to include only withdrawals by manual means to protect *chena* (slash-and-burn) cultivators and not commercial farms, hotels or industries. What about underground water? Can a landowner be regarded as owning the water underneath his land and permitted to take, whatever quantity he could capture? An occupier’s use of groundwater must be reasonable. This “reasonable use” must exclude mechanical means of pumping, for which purpose an “entitlement certificate” should be obtained specifying the conditions, limiting the quantities that can be drawn. These doctrines must be discussed and agreed upon, if the new policy is to make any headway.

Capacity Development - HRD

The delegation of water-resources management to the lowest-appropriate level necessitates educating and training water-management staff at all levels and ensuring that women participate equally in the education and training programs. Particular emphasis has to be placed on the introduction of public participatory techniques, including enhancement of the role of women, youth and local communities. Skills related to various water-management functions have to be developed by municipal government and water authorities, as well as in the private sector, local/national nongovernmental organizations, cooperatives, corporations, and other water-user groups. Education of the public regarding the importance of water and its proper management is also needed.

To implement these principles, communities need to have adequate capacities. Those who establish the framework for water development and management at any level, whether international, national or local, need to ensure that the means exist to build those capacities. The means will vary from case to case. They usually include:

- Awareness-creation programs, including mobilizing commitment and support at all levels and initiating global and local action to promote such programs.
- Training of water managers at all levels so that they have an appropriate understanding of all the elements necessary for their decision making.
- Strengthening of training capacities.
- Appropriate training of the necessary professionals, including extension workers.

- Improvement of career structures.
- Sharing of appropriate knowledge and technology, both for the collection of data and for the implementation of planned development including nonpolluting technologies and the knowledge needed to extract the best performance from the existing investment system.

Awareness and Media Campaigns

Although water-resources issues featured prominently in the media, apart from concerns for “possible taxing” and pious statements extolling the virtues of a “fundamental” human right to water, what specific action was propounded by the critics in the given scenario? Does the statement “right to water” imply an inherent right to an unlimited amount of water for all human activities at all times at zero cost? It is useful to highlight the following questions:

- Who benefits from free water withdrawals?
(surface water or underground)
They are the major investors: hotels, swimming pools, industry, golf courses, large landowners (all those who have the capacity to use mechanical means of withdrawal of water).
- Who suffers from free water withdrawals?
They are the poor (peasants and all others who resort to manual means of withdrawal):
 - * the environment, in general
 - * aquatic life, fish
 - * biodiversity

The message should be that as Sri Lanka reaches the limits of water-resources utilization, our bulk water-allocation system needs to be efficient and disciplined. If timely action is not taken now, the result would be a crisis and a lost opportunity as we recently experienced in the power sector in Sri Lanka.

The absence of the National Policy and related documents in Sinhala and Tamil also prevented a meaningful dialogue as it permitted the English-speaking, Colombo-centered NGOs to interpret the water policy to the people.

Approach of One Step a Time

The document titled “National Water Resources Policy and Institutional Arrangements” presented to the Cabinet of Ministers in March 2000, attempted several major reforms such as Water Entitlements, Transferable Water entitlements, Demand Management including pricing, etc. Table 2 gives the water resources management functions identified.

Table 2. *Water Resource Policy Components*

Major Components	Additional Components
<ul style="list-style-type: none"> • Water Resources Policy Foundation • Water Rights and Allocation Policy • Water Resource Demand Management Policy • Groundwater Management Policy • Water Resource Information Management Policy • Institutional Structure for Water Resource Management 	<ul style="list-style-type: none"> • River Basin Planning and Management • Drought Management and Flood Control • Water Resource Development and Financing • Water Quality Management • Other topics to be determined

Water has become an all-embracing, a hold-all term in recent years. It means different things to different people. The variations in individuals' notion of "water," and "water policies" range from one's immediate surroundings to the political setup or socioeconomic conditions. The foregoing section on the critique of the national policy clearly illustrated that any attempt to achieve all the multiple objectives of the sectoral users, such as demand management and cost recovery would retard its progress on the major task, namely the bulk-allocation strategy.

The demand management section particularly gives rise to fears of "attempted sale of water." While the user cost-recovery fees have been well established for over two decades with respect to drinking water, not much progress has been made for user cost recovery for irrigation water by the management of "field" channels, etc., by farmer organizations. When the IWRM policy document refers to principles of user cost recovery whereby the beneficiary or the water user is called upon to bear the cost rather than the entire society, much leeway is given to those who champion the cause of obstructing projects in the guise of a poor-friendly stance.

The summary recommendations of an Expert Study Group set up by the National Science and Technology Commission are reproduced in annex 1. The document sets out the objections to transferable water entitlements and pricing, which would render water a marketable commodity. It laments the lack of measures for catchment and watershed protection and pollution of surface water and groundwater. Clearly, these are the functions of river-basin agencies and the Central Environmental Authority.

In order to go forward in this apparent tangle, the best option for the IWRM policy initiative is to tackle one problem at a time, namely the single objective of bringing about the nonpartisan authority for bulk water allocations. The question of cost recovery by the sectoral consumptive users of water must best be left to such agencies and sectoral Ministries.

The National Water Resources Policy, completed in March 2000, should serve as the cornerstone for the development and utilization of water resources over the time horizon to 2020. The policy of March 2000 needs to be revised and reviewed periodically thereafter. Policy includes efforts to ensure water availability to all the inhabitants through a system of bulk entitlements, appropriate institutional changes and a legal and regulatory framework. The policies outlined for various sectors must be purposefully followed and a change of strategy, as outlined above, needs to be followed in order to carry the process forward.

ANNEX I

Summary Recommendations of an Expert Study Group on the National Water Resources Policy and Institutional Arrangements

1. An IWRM policy was essential to the proper management of the water resources of the country.
2. The state should be the custodian of the water resources of the country and not its owner.
3. Entitlements, pricing and transferable entitlements are the means by which sustainability in water resources is sought to be achieved.
 - In reality, pricing and transferable entitlements would make water a marketable commodity and it could result in hardships for the poor and could endanger the food security we currently have.
 - It could even pave the way for bulk entitlements being transferred to international organizations. This should not be permitted on any account.
 - Entitlements, which could be designated as permits, should be given to bulk (group) users and other large users as envisaged in the document for a fee. It should be left to the group users (such as the NSWB, Irrigation Department) to distribute water, recover costs and effect savings in water use.
 - The policy should clearly state that it will formalize the current pattern of water use and would not effect any changes to current practice/use by farmers or the public for domestic use.
 - Transfer of water entitlements should be under strict supervision and transparency.
 - The policy, in attempting to reduce water use by paddy farmers, has paid no attention to food security as measured in terms of rice production. Food security as a measure of paddy (rice) production should be maintained.
 - As this section on entitlements is the most important part of the policy document it should be redrafted in clear concise language leaving no room for ambiguity and providing the necessary safeguards.
4. The National Water Resources Authority (NWRA) being a small apex body must depend on other institutions to carry out its activities and it should, therefore, be placed under the Head of State/Prime Minister, to be effective.
 - There is no provision in the Water Resources Act for the Water Resources Council to play an effective role.

- The Water Resources Tribunal should be placed under the Ministry of Justice so that there can be no accusation of partiality.
 - Legislation - the Water Resources Act drafted in terms of this Policy has been amended many times and there is no approved legislation as yet to give effect to this policy.
5. The policy has been framed with no consideration given to the regional differences in water availability and management in the dry and wet zones of the country. The policy should be redrafted with these differences in mind.
6. Conservation of water
- Protection and maintenance of the watersheds and catchment areas have not been given the importance they deserve. A strong statement and provision should be made in the legislation.
 - Pollution of surface water and groundwater as the cause of reduction of water availability has not been dealt with. The prevention of pollution should be strongly emphasized and planned for.
7. Groundwater problems and issues are dealt with adequately but there should be a rearrangement of sections.
- Because of the phenomenal growth of groundwater exploitation without management, we recommend that groundwater management and regulation be given the highest priority, in both wet and dry zones.
 - Responsibility for data collection, monitoring and management of groundwater should be placed under one agency, preferably the Water Resources Board, which should have its capacity enhanced.
8. It is stated that the NWRA will maintain a data base/bank on all aspects of water resources. It would have to be made compulsory by legislation that the agencies, which deal with water, collect and make this available to the NWRA. This would be effective only if the NWRA is under a powerful Ministry.
- It is stated that the policy will be interpreted in a gender-sensitive manner. This is inadequate and it should be stated that women will also be consulted on matters pertaining to water policy. Priorities should be given to drinking/domestic water and for industrial needs and tourism. However, maintenance of the natural environment and biodiversity is adequate.
9. Cultural aspects and quality of life could be adversely affected by this policy, if it succeeds in making water a tradable commodity.

September 2001

National Science and Technology Commission of the Ministry
of Science Technology

Thailand's Efforts in Introducing Water Policy and Initiating Related Institutional Development for Integrated Water Resources Management⁶

Overview

Introduction

Under the Asian Development Bank's (ADB's) Regional Technical Assistance RETA 5812, the International Water Management Institute (IWMI) began a study on Development of Effective Water Management Institutions in 1999 and it is now reaching its concluding phase. The last major event was the regional meeting held at the United Nations Economic and Social Commission for Asia and the Pacific (ESCAP) in Bangkok, along with the Ministerial Roundtable Dialogue among Ten Asian nations on Water Sector Challenges, Policies and Institutional Development in Asia, during 23-24 May 2002.

Under this assistance, IWMI had carried out several studies, researches and workshops/seminars/meetings in Asia. In particular, the Five-Country Regional Study (IWMI 2001) is a good example of IWMI emphasis on Integrated Water Resources Management (IWRM), which covers the following river basins: a) East Rapti river basin, Nepal, b) Ombilin river subbasin in West Sumatra, Indonesia, c) Upper Pampanga river basin, the Philippines, d) Deduru Oya basin, Sri Lanka, and (v) Fuyang river basin, China.

As a part of activities for Thailand, IWMI engages a short-term consultant to perform a review on "Thailand's Efforts in Introducing Water Policy and Initiating Related Institutional Development for Integrated Water Resources Management." This exercise aims at developing a country report, analyzing the country efforts, successes and failures in installing appropriate policies and institutions for IWRM. In preparing this paper, the consultant has performed the following:

1. A review of available literature, both locally and internationally, with particular reference to government documents on related laws and procedures, and policy statements.
2. Identifying conditions that enabled or inhibited the successful implementation of policy intentions and commenting on the appropriateness of the chosen policies relative to the desired objectives of IWRM.
3. Identifying strategic areas for further research and policy initiatives that may be necessary to make Thailand's efforts towards making improved IWRM more effective.

Efforts in IWRM by Regional Institutions and GMS Countries

Before assessing the IWRM aspects in Thailand, it is useful to have an overview of what have been initiated and implemented by various regional players and by the neighboring countries of Thailand, especially those in the Greater Mekong Subregion (GMS). In recent years, several regional institutions and countries in Asia promoted, and were committed to the application of, IWRM. The

⁶Prepared by Lien, Nguyen Duc, Consultant to IWMI.

activities of the institutions aim at supporting the country's own efforts in this newly recognized water resources management approach.

Ministerial Roundtable Dialogue on the Water Sector. The Ministerial Delegations of Ten Asian Nations at the Dialogue held in Bangkok on 22-23 May, 2002, Thailand (Vermillion 2002), issued an eight-point Joint Statement on Water Sector: Challenges, Policies and Institutional Development in Asia (Joint Statement, 2002). The Delegations have duly noted, with concern, the following water-related problems affecting the people and environment of Asia:

1. Recurring water shortages and droughts.
2. Recurring flooding and inundation of lands and settlements.
3. Lack of access to safe and affordable drinking water and sanitation facilities for all, especially for the poor.
4. Degradation of environment in catchment and downstream areas.
5. Increasing water pollution.
6. Shortage of funds for water infrastructural development and management.
7. Need to enhance the socioeconomic value of water, especially to realize its potential for food production, employment generation and poverty reduction.
8. Need for optimal utilization of water in river basins.
9. Lack of institutional development, capacity building and public awareness.

International Water Resources Management Institute (IWMI). The work of IWMI is focusing on the sustainable use of water and land in agriculture and the water needs of developing countries. IWMI works with partners in the South to develop tools and methods to help these countries eradicate poverty through more effective management of their water and land resources, and its mission is as follows: “*Improving water and land resources management for food, livelihoods and nature.*” IWMI is involved in the following five main areas:

1. IWRM for Agriculture.
2. Sustainable Smallholder Land and Water Management.
3. Sustainable Groundwater Management.
4. Water Resources Institutions and Policies.
5. Water, Health and Environment.

Besides the Five-Country Regional Study mentioned earlier, IWMI is carrying on several other activities in Southeast Asia and in Thailand, including training and workshops in IWRM and other researches (IWMI 2002). These include a) a Regional Seminar on Governance for IWRM in a

River Basin Context, b) a basin perspective in water savings, c) sharing lessons across river basins, d) dealing with drought, and e) sustainable smallholder water- and land-management systems.

Global Water Partnership (GWP) and Its Southeast Asia Technical Advisory Committee (SEATAC). The GWP was established with the mission “to support countries in the sustainable management of their water resources,” and to accomplish its following objectives:

1. Clearly establish the principles of sustainable water-resources management.
2. Identify gaps and simulate partners to meet critical needs within their available human and financial resources.
3. Support action at the local, national and river-basin level that follows principles of sustainable water-resources management.
4. Help match needs to available resources.

For Southeast Asia, its Vision for Water in the 21st Century is for “the attainment of sustainability of water resources to ensure sufficient quantity of acceptable quality to meet the needs of people of Southeast Asia in terms of health, food security, economy and environment.” In the past few years, SEATAC has conducted several activities for the region and Thailand: a) regional dialogue on water governance, b) regional forum on capacity building for IWRM in Southeast Asia, c) establishment of water partnerships, d) workshops on IWRM issues and integrated assessment, e) raising awareness on IWRM and water-related issues in Thailand, and f) review of Thailand Water Partnership.

ASEAN Working Group on Water Resources Management. The Working Group was established by the ASEAN Senior Officials on the Environment (ASOEN) during their 13th Meeting on 17-19 July 2002. The working group will be cooperated on the following areas:

1. Networking and collaborative actions on IWRM.
2. Exchange of relevant information, expertise, technology and know-how on water management.
3. Training, education and awareness-raising campaigns on IWRM. Thailand will serve as the first host and Chair of the working group and member; the working group will soon be nominated by the ASEAN countries.

Mekong River Commission (MRC). The MRC, the successor of the Mekong Committee (MC) and Interim Mekong Committee (IMC), was established in April 1995 by the four countries of the lower Mekong river basin; Cambodia, Lao PDR, Thailand and Viet Nam (MRC 1995 Agreement). The Mission Statement (MRC 1998) is: “to promote and coordinate sustainable management and development of water and related resources for the countries’ mutual benefit and people’s well-being by implementing strategic programmes and activities and providing scientific information and policy advice.” The MRC, a regional organization comprising a Council, a Joint Committee and a Secretariat, involves its work in four key result areas:

- Natural Resources Planning and Development.
- Environmental Management and Social Considerations.
- Databases and Information Systems.
- Organization Management and Cooperation.

With the participatory program approach, MRC formulates and implements regional activities related to IWRM, which involve two or more countries, while the “national projects” are under the auspices of the country concerned. However, the countries would have to fulfill, among others, their main duties on reasonable and equitable utilization of water, as stipulated in the 1995 Agreement signed by the States in the Lower Mekong basin (Kristensen and Lien 2000). These include a) notification to the Joint Committee for uses on tributaries, and for intra-basin use of the Mekong mainstream during the wet season, b) on the Mekong mainstream, prior consultation which aims at arriving at an agreement by the Joint Committee for interbasin diversion during the wet season, and for intra-basin during the dry season, and c) specific agreement by the Joint Committee for an interbasin diversion, except for surplus water during the dry season, which is subject to prior consultation. In this connection, the riparian countries including Thailand should observe two sets of regulations for projects and activities located within the Lower Mekong basin, i.e., regulations under the respective national legislation and those under the MRC 1995 Agreement. Recently, at its Council Meeting on 12 November 2002, MRC adopted the “Preliminary Notification Procedures for Notification, Consultation and Agreement” for application in the riparian countries (MRC homepage 2002), while waiting for the water rules to be developed under the Water Utilization Program (WUP). At present, MRC is undertaking several important regional programs for integrated sustainable resources management covering the Lower Mekong basin (MRC 2002; Annual Report 2001). These include a) a Basin Development Plan, b) WUP, c) Environment Program, d) Capacity Building Program, and e) Other Operational Programs: Fisheries, Water Resources and Flood Management and Mitigation, Agriculture, Irrigation and Forestry, Navigation, etc.

ADB and GMS Activities. ADB has been pursuing Agenda 21 of the Earth Summit of 1992. It has also been practicing sustainable water resources management over the past decades. Since 1993, it initiated a process of policy analysis on integrated water resources development and management (ADB 1995). ADB supports the assessment of IWRM in several countries in Asia. These include, for Thailand and other GMS countries, the capacity program, in which efforts are concentrated on water-sector assessments, strengthening of institutions and personnel, law and regulations as well as the setting up of a national water-resources committee/council and a river-basin organization/committee. Research, study and training and other related issues, such as sustainable development and management, participation of stakeholders, to name a few, are also supported by ADB to its member countries. At present, ADB is conducting several projects concerning IWRM in the GMS countries: a) promoting IWRM in river basins, b) agriculture-sector program, c) region area development and rural development, d) environmental improvement and socioeconomic programs.

Efforts by the Thai Neighboring Countries in IWRM. The countries neighboring Thailand are actively undertaking an IWRM approach in their development and conservation of water resources. Similar to Thailand, they conduct various related national activities and cooperate with the international and regional institutions and other countries in the efforts towards IWRM. While the

Thai draft Water Resources Act is planned to be reviewed for submission to its parliament for approval, Cambodia, Lao PDR and Viet Nam enacted their National Water Laws several years ago, and their respective national water-resources councils/committees are being set up to oversee the water sector. Recently, on 1 October 2002, the Water Law of the People's Republic of China also came into force (Xinhua News Agency 2002). The water legislation is considered to be a prerequisite for comprehensive improvement in governance and for integrated management at both national and river-basin level.

Water Resources Development in Thailand and Its Efforts in IWRM

Thailand, its water resources potential and development. Thailand is located within the tropical belt with an area of 513,00 km² and is an agriculture-based country. Of the 268,000 km² of the cultivable land 210,033 km² are under cultivation. More than 60 percent of its population engages in agriculture. The Thai population is now over 63 million, of which the urban population is about 11 million concentrated in the capital, Bangkok, and regional centers. Thailand has achieved significant economic growth over the past two decades, about 8 percent annually, during the 1990s. However, the Asian economic crisis of the late 1990s has caused the GDP to decline from about 2.0 percent to 4.0 percent since 1996 (ONWRC 2001). Agriculture continues to play a critical role in the Thai economy. It employs about half of the labor force and accounts for about 14 percent of export (down from 23% in 1971 as a result of growth in other sectors), and is the only part of the economy which is still achieving growth.

The total water resources of Thailand, from both internal and external sources, are estimated at about 800,000 million cubic meters (MCM) per year. The country has been divided into 25 river basins, but only eight of these are major river basins, while many are subbasins. The total water storage capacity developed throughout the country is about 57,000 MCM, around 43 percent of the average annual runoff.

The main river basin of the country is the Chao Phraya, which covers about 20 percent of the country, incorporates 27 million people and accounts for the majority of the agricultural production as well as industrial and urban areas including Bangkok. The Chao Phraya is suffering from pressure of water in terms of both quantity and quality. Thailand uses water in the North and Northeast from the Mekong international river basin, which runs through six countries (Yunnan of China, Myanmar, Lao PDR, Thailand, Cambodia and Viet Nam). Thailand has joined three other riparians in setting up the MC in 1957 and then the MRC in 1995 to manage this basin's water and related resources.

Water demand, amounting to an average annual 53,000 MCM (ONWRC 2001) is increasing due to rapid economic development; the population growth (12% in the 1990s) during the past decades has caused more pressure in the availability of water and on water quality. Severe drought was experienced in the Northeast and Central regions and frequent flooding has occurred nationwide, due to the effects of deforestation and other man-made activities. During the 1990s, Thailand adopted a supply side approach to water management, making huge investments in the development of dams, irrigation and other water-supply projects. Little emphasis has been placed on demand-side management, little or no cost recovery is effected in the agriculture sector, which consumes over 70 percent of the total withdrawals, and low tariff applied to other users. Future water resources projects, however, are constrained by environmental concerns and budget limitation and, therefore, a lower space of development would be affordable.

According to the ADB's Country Strategy and Program Update 2002-2004 (ADB 2002), about 94 percent of the urban population are currently served with treated pipe-borne drinking water. About 88 percent in the rural areas are served with safe drinking water from piped water systems, rainwater jars and tube wells; however, they rely on other sources for household consumption. Water shortage and pollution problems will become more serious in the future. As a policy matter, Thailand places high priority in attempting to meet, by the year 2015, the International Development Targets adopted by the United Nations' Millenium Assembly in October 2000, i.e., to reduce by half the number of people who do not have access to safe drinking water (RTG 2002a).

Introduction of IWRM in Thailand. In recent years, due to the limitation of water resources to satisfy the increasing needs in agricultural, domestic, industrial, pollution abatement and environmental conservation, the Royal Government of Thailand (RGT) embarked on various measures towards IWRM. The setting up of the National Water Resources Committee (NWRC) and its Office (ONWRC) in the past decade for coordination of activities in the water sector is a commendable action that tries to fulfill this ambition. The NWRC and agencies concerned have joined hands to improve certain water-management issues. The cooperation between the Royal Irrigation Department (RID) and the Electric Generating Authority of Thailand (EGAT) in sharing available water from the large reservoirs on the Chao Phraya river for various uses, including power generation, agriculture, irrigation, etc., is a good example of the NWRC role.

However, there remain a number of serious problems and management issues that need to be resolved. These include, to mention a few, water scarcity, poor water allocation and the lack of a formal system of water rights, which create negative impacts on many water users, particularly those in the downstream locations. Even with the new structure under the 2002 Bureaucracy Reform, many agencies are still involved in water-resources development and provision of water services. Their activities were uncoordinated and often conflicting, resulting in poor economic efficiency and significant cumulative environmental impacts on resources.

At the root of many of these problems are weakness in the water-resources policy, poor coordination and regulatory management, and weak political commitment. Also, arrangements for decentralization and public participation in water-resources management are not well developed yet. In this connection, RTG is committed to strengthen ONWRC to coordinate water-resources management.

In addition, there are concerns regarding watershed management, flood and drought problems, overuse of groundwater (particularly in the Bangkok area), water quality relating to industrial, municipal and nonpoint sources. Information on water resources has not been adequately shared between agencies or with water users. The involvement of water users and other stakeholders in the water-management decision process is poor. Transparency and accountability need to be improved and the degree of polarization and politicization in the water sector need to be decreased.

To implement the necessary reform measures, RTG aims to establish a comprehensive, unified water management system by reforming the existing policy, legal, and institutional framework. Recently, RTG launched the Bureaucracy Reform to restructure all ministries and departments. These are presented in the sections below.

Policy on Water Resources Development and Management

Basic Principles

At present, the RTG places emphasis on the realization of the three basic principles for water-resources management: a) good governance, b) integrated river-basin management, and c) management tools (RTG 2002b).

Good Governance in water resources management, including the following actions:

- Secure equitable access to safe drinking water and water for subsistence level of life and occupation.
- Appropriately allocate water among competing demands.
- Promote participatory sharing of benefits from large projects.
- Manage water at the lowest appropriate level.
- Protect water quality and ecosystems.

Integrated River Basin Management involving the following actions:

- Increase sustainable use and management of water in a river basin.
- Strengthen river basin organizations (committees).
- Adjust government agencies' roles to support localities in managing water resources.
- Promote knowledge in integrated management of water and related resources.
- Promote capacity building among groups of stakeholders.
- Establish a water fund for river-basin management.

Management Tools composing of:

- Mechanism for conflict resolution.
- Network of specialists in water-resources management.
- Trainers for river-basin management who are trained from localities.
- Strategic planning, legislation and regulation.

Policy towards IWRM and Action Plans for Water Sector

Evolution in water resources management. In the past, Thailand did not pay much attention to IWRM because water was abundant, and anyone could obtain the required amount of water from

rivers, lakes, canals or from rainfall. Little emphasis was placed on sustainable use of water, pollution control, etc., to cope with the increasing demand for water by various users and the increasing population, Thailand has to adjust her policy towards water-resources development and water-resources management practices.

It has gradually evolved from development-focused efforts towards a management-oriented program. This evolution is the shift from building storage capacity and the construction of major water-resources projects and drainage systems on a large scale to the establishment of IWRM, in which small-scale water-resources schemes, river-management measures and integrated river-basin management are key elements. In this evolution, the integration of measures for social improvement, environmental concerns and public participation has become a prominent feature in the planning, development and management process.

National water vision. Similar to other countries in the Southeast Asia region and the GMS, in the past few years Thailand has embarked on IWRM and developed various policies, action plans and legal instruments towards the implementation of IWRM. In July 2000, the following National Water Vision was established (Anukularmphai 2001):

“By the year 2025, Thailand will have sufficient water of good quality for all users through an efficient management, organizational and legal system that would ensure equitable and sustainable utilization of its water resources with due consideration on the quality of life and participation of all stakeholders.”

Policy and priority actions towards IWRM. In order to achieve the Vision’s objective, the New Thailand National Water Policy was completed and ratified by the Cabinet in October 2000 with the following nine points (RTG 2002b):

1. Accelerate the promulgation of the Draft Water Act to be the framework for national water management by reviewing the draft and implementing all necessary steps to make the act effective, including reviewing existing laws and regulations.
2. Create water-management organizations both at national and river-basin levels and support them with legislation. The national organization is responsible for formulating national policies, monitoring and coordinating activities to fulfill the established policies. The river-basin organizations are responsible for preparing water-management plans through a participatory approach.
3. Emphasize suitable and equitable water allocation for all water-use sectors, and fulfill basic water requirements in agriculture and domestic uses. This will be accomplished by establishing efficient and sustainable water-use priorities for each individual river basin. These will be based on clear water allocation criteria and incorporating beneficiaries’ cost-sharing, taking into account their ability to pay and the level of services.
4. Formulate clear criteria for raw water provision and development, compatible with the basins’ resources potentials, ensuring suitable quality while conserving the natural resources and maintaining the environment.
5. Provide and develop raw water sources for farmers widely and equitably in response to water demand for sustainable agricultural and domestic use, in a way similar to other basic infrastructural services of the government.

6. Include water-related topics at all levels of the national curriculum so as to create awareness for the value of water, understanding the importance of efficient use of water and the necessity and responsibility in maintaining natural and man-made water sources.
7. Promote and support participation, including clear identification of its procedures, clear guidelines on the rights and responsibilities of water users, both nongovernment and government organizations, in efficient water management. Water management includes water utilization, water resources conservation and preservation of water quality.
8. Accelerate the preparation of planning for flood and drought protection, including warning, damage alleviation and rehabilitation, efficiently and equitably, with proper utilization of land and other natural resources.
9. Provide sufficient and sustainable financial support for action programs in line with the national policy, including related research, public awareness, information management and technology transfer to the public.

Water-Resources Management at National and River-Basin Level

As demonstrated earlier, Thailand has been trying very hard in the recent past to implement IWRM. However, it is still encountering a number of serious problems and obstacles at different levels, from national level to river basin level, as briefed below:

At the national level, the following issues need urgent solutions:

- *Policy and plan.* There is no unified policy and strategic plan for the water sector. Plans are made by individual agencies without the participation of related parties.
- *Institutional framework.* Before the Bureaucracy Reform in November 2002, there were more than 30 agencies in 9 ministries working in water resources development and there are 7 national committees involved in this field. Now, under the ongoing Bureaucracy Reform process, the numbers are reduced to about half, i.e., more than 15 agencies and 5 ministries, and it is expected that more logical arrangements for IWRM would be realized.
- *Budget.* A budget is allocated to each agency upon its request. In such a process, it lacks the holistic approach towards problem-solving and becomes less-effective in the implementation plan.
- *Legal framework.* There are several acts concerning water but not even one that directly relates to water-resources management in an integrated way. In this regard, the draft Water Resources Act should be revised in accordance with the newly established government structure and enacted soonest to facilitate IWRM.
- *Data and information.* Because of too many implementing agencies, data and information of water resources development are scattered. There is no networking for information transfer.

At river-basin level, the following issues would need active participation of all parties concerned, especially the stakeholders:

- *Management mechanism.* The unclear policy, legal and institutional framework, together with the involvement of several agencies in the development of the river basin, are the main difficulties for effective river-basin management;
- *Participation of stakeholders in the development process.* Water-resources development projects, except for small-scale schemes, are planned and implemented by government agencies with the participation of civil servants. This process has proven to be unacceptable as the local population and other stakeholders are demanding more information and requesting a role in the decision making. This attitude needs to be changed and it is important to seek the opinion of the parties concerned from the very early stage of project formulation. Continued dialogue should be maintained throughout the development process. On the other hand, the stakeholders have to adopt a more cooperative and objective stance with keen interest to compromise for the sake of benefits to people.
- *Conflict management.* Normally, many conflicts surface during public hearing or consultation. The conflicts involve environmental issues, and compensation for affected people or among different interest groups. At present, there is no mechanism for resolving these critical and sensitive issues.
- *Sense of ownership and sharing of responsibilities.* Since the government provides all costs to the water-resources infrastructure, the beneficiaries have little appreciation and, therefore, little sense of ownership. This attitude also needs to be changed through appropriate introduction of public relations, economic measures and others.

Legal Framework for IWRM

The 1997 Constitution

The enactment of the new Constitution in 1997 has a significant influence on how the government and its agencies and local communities manage the country's natural resources. The Constitution impacts on the natural resources and environmental policies, the implementation and operation of national projects and on the interpretation of relevant laws and regulations. In particular, the new Constitution provides for a) increased requirement of the state to encourage civil society to participate in preserving, conserving and utilizing natural resources and biodiversity in a sustainable manner, b) greater decentralization of government responsibility to the *tambon* (subdistrict) level to manage resource use and development, c) more direct participation by civil society in planning, managing and utilizing natural resources and in developing and enacting laws, d) greater access of civil society to information. These provisions favor the concept of good IWRM, which demands a high level of community/stakeholder awareness and participation, local-level planning and transparency.

The overall scope and intent of the new Constitution provide for not only a climate of open participatory management but also an obligation on government administration to implement this approach. This is particularly relevant to the role, function and operation of the ministries, departments and other organizational units to be set up under the Bureaucracy Reform in 2002.

Prevailing Water-Sector Laws

Prior to the Bureaucracy Reform in October 2002, Thailand has at least 30 water-related laws, administered by over 30 departments overseeing water issues in eight ministries (Ministry of Agriculture and Cooperative [MOAC], Ministry of Transport and Communication, Ministry of Industry, Ministry of the Interior, Ministry of Public Health, Ministry of Labor and Social Welfare, Ministry of Education, and Ministry of Science, Technology and Environment). Like water policies, the mass of water laws, codes, and instructions, etc., have all been framed for particular, and usually singular, purposes (ONWRC 2002). There is no umbrella legislation to link these laws and codes, and consequently there is no legislative backing for an organization to undertake IWRM. This results in the relationships among all agencies being ad hoc and often erratic, as the agencies pursue their objectives and mandates and seem to be more interested in enhancing water supply in order to meet demands from politically powerful groups of water users. Water permits are not issued and bulk water use by irrigation, hydropower, domestic, town water and industry is not properly controlled. With new developments occurring, although many at small scale for local use, their cumulative adverse impacts on the equitable distribution of water and on the health of the aquatic environment are significant.

With regard to groundwater, the only direct law is the Groundwater Act 1977 (amended in 1992). The Act was put in place for regulation groundwater utilization after the government realized the adverse effects from uncontrolled use of this valuable resource. The Ministry of Industry is empowered to issue permits for well drilling and operation, and collecting fees from private-sector users. The Groundwater Control Division is responsible for such permit issuance within the Bangkok Metropolitan Administration (BMA) and its surrounding provinces, namely, Pathumthani, Nonthaburi, Samut Prakarn, Samut Sakon and Nakhon Phathom.

In summary, the existing laws, policies and strategies relating to water-resources management do not provide a comprehensive coverage, a clarity of roles and functions, and they are not sufficiently integrated to provide a focus for good IWRM. The absence of a modern, comprehensive water-resources law is probably the most significant factor inhibiting good IWRM in Thailand.

Draft Water Resources Act

The inadequacy in the many water-related laws in Thailand has led to the drafting of a new and more comprehensive and integrating Water Resources Act (ONWRC 2001). The draft Act is designed to “control and manage water resources, the land adjoining the water resources and other related natural resources” and to establish organizations for the management of water resources at the national and local level. The draft law includes:

- Definitions, membership and powers of NWRC.
- The establishment of river-basin committees, to be appointed by NWRC.
- Definitions, mandate and powers of ONWRC (including upgrading of the Director’s post to Secretary General, which would give the organization a higher status).
- The establishment of water user organizations.
- Rules for water distribution, including allowing the sale of water, metering and fines for illegal abstraction.

- Assignment of responsibilities for flood protection and relief.
- Assignment of responsibilities for conservation and development of water resources.

Although the draft water law has been discussed at a number of fora in Thailand over several years, there is general agreement as to its benefit within the bureaucracy. A number of clauses, particularly those pertaining to payment for abstraction and penalties for illegal abstraction, polluting, etc., are very controversial amongst politicians.

The draft Water Resources Act covers water distribution and gives this role to the new “river basin committees.” The mandate given to river-basin committees is to act as coordinating bodies concerning largely strategic natural-resources or water-resources planning, with a responsibility for broad or bulk allocation of water between water users within geographic zones. In this role under the proposed new law, they can be innovative and play an important part in achieving good river-basin management and provide a critical link between the communities and stakeholders at the tributary basin level and a higher basin level or national authority.

However, there is a fundamental flaw in the draft Water Bill in that it does not provide a mandate for any agency to be the a national water-resources manager. This should be at the core of any water-resources law. Although it is specified in the draft document that the ONWRC is to be the water-resource management agency, yet the functions specified do not allow the ONWRC to undertake comprehensive water-resources management.

In its current form, the draft Water Resources Act would not provide a suitable basis for promoting good IWRM or for a comprehensive approach to river basin management throughout the country. Clearly, some considerable work has to be undertaken to develop the draft into an appropriate document that fulfills these needs. This intended revision is now planned as one of the processes of the ongoing Bureaucracy Reform.

Institutional Development for IWRM in Thailand

Institutions for IWRM and Mechanisms for Interagency Coordination

National Boards and Committees. The principal boards and committees are responsible for developing policies for water-resources development, management and conservation. Among others, the following are the main players in IWRM (ONWRC 2002): a) the National Economic and Social Development Board (NESDB), b) the National Environment Board (NEB), c) NWRC, d) Thai National Mekong Committee (TNMC), e) Ad Hoc Committee for Solving Water Problems, and f) Chao Phraya River Basin Committee. The presence of three bodies having similar functions leads to confusion and indecision on the implementation of water policies and their priorities. Although these committees carry out some aspects of water-resources management coordination and regulation, none are responsible for the full range of needed activities. This is considered to be counterproductive to good IWRM and operation of the basin organizations.

The relative importance of these bodies cannot be easily determined from their functions and powers. Based on their mandates, the responsibility of NWRC relates more directly to water resources than to the other two boards, while the tasks of NEB are more related to water resources than to those of NESDB.

Since NESDB plans are usually quite broad, more detailed policies and operational plans are required from each individual sector. In this regard, NWRC should prepare more elaborate water

policies and operational plans within the framework determined by NESDB. The NESDB plan is, in fact, a framework for water policies, which are formulated by NWRC and NEB.

The NWRC and its office. The national water-management problem was well-recognized by the government and, in 1979, a coordinating body was created at the Prime Minister's office to perform the coordinating role among agencies concerned with water development and utilization. Subsequently, the NWRC was established in 1987 to serve as an apex body in developing policy and coordinating water-related issues at the national level in recognition of the multiagency arrangements and overlaps in the water sector. A permanent secretariat office, ONWRC, was established through the Royal Decree of 15 March 1996 for coordination among various major water-related agencies and to serve as the secretariat of the NWRC with the responsibility for the following (ONWRC 2001):

- Carry out tasks related to water-resources management.
- Carry out tasks related to the secretariat of the Committee.
- Work with or support other agencies in this field.

The rules and regulations of the NWRC (with 7 articles) were promulgated in 1998 along with those of the ONWRC (with 10 articles). From these regulations, it is clear that the NWRC is intended to be the top policy-level committee with ONWRC playing the subsidiary role of monitoring and controlling the operations of other government departments in the sector. This can be seen to be analogous to the requirement to coordinate other departments. The ONWRC is headed by a Director and supported by the Legal Section and Experts in Water Resources. Its organizational structure includes several branches and section: a) Policy and Planning Branch, b) Operation, Coordination and Evaluation Branch, c) Research and Foreign Relation Branch, d) Water Resources Information Branch, e) Public Relations and Mass Coordination Branch, and f) General Administration Section.

The NWRC is, however, only one of six national committees, which are involved in some aspects of water-resources policy and coordination. The NESDB prepares broad five-year socioeconomic development plans, which cut across sectors and ministries. These plans also set regional development priorities. In response to the severe drought of 1993, the Thai Government created an "Ad Hoc Commission for Solving Water Problems. The Commission is chaired by the Prime Minister who is empowered to deal with flood, drought and water-quality degradation problems.

ONWRC programs vary in quality. Some are not "demand-driven" and are not supported by the necessary technical capability, legal base, work plans and implementation arrangements. The staff and capability of ONWRC are also limited.

NWRC has recently become more active in establishing river-basin committees, reviewing draft national water-resources policy and establishing a task force to revise the draft water law. The NWRC is also increasing the frequency of its meetings and has established a number of subcommittees (interministerial task forces) to develop recommendations regarding water-resources policy, groundwater management and flood and drought mitigation.

The 2002 National Bureaucracy Reform and New Government Structure

On 2 October 2002, Thailand enacted Act B.E. 2545 (2002) for overall National Bureaucracy Reform by structuring all ministries and departments and grouping them into 20 Offices and

Ministries, some of which were newly established (RTG Homepage 2002): a) Office of the Prime Minister, b) Ministry of Natural Resources and Environment (MNRE), c) Ministry of Agriculture and Cooperatives (MOAC), d) Ministry of Energy, e) Ministry of Industry, f) Ministry of Interior, g) Ministry of Science and Technology, h) Ministry of Transportation, i) Ministry of Foreign Affairs, j) Ministry of Commerce, k) Ministry of Culture, l) Ministry of Tourism and Sport, m) Ministry of Defence, n) Ministry of Finance, o) Ministry of Social Development and Human Resources, p) Ministry of Justice, q) Ministry of Labor, r) Ministry of Information and Communication Technology, s) Ministry of Education, and t) Ministry of Public Health.

In the past, the Thai bureaucracy had been reorganized on several occasions. However, its operation was not responsive to the needs of the country and the changing world, due to procedural requirements and overlapping of works by various authorities resulting in ineffective services to the public. Under the new reform, agencies providing similar and related services will be grouped under the same department and ministry for more effective operations. The Act names the ministries and departments, while various Task Forces are to be established in each ministry to reorganize and establish bureaus/divisions and units under the departments, as well as offices in the provinces. As the Bureaucracy Reform has just been started and the assignment of Department Heads and allocation of staff to various ministries are being undertaken, it will take sometime for the process to be accomplished and functioned as intended by the reform.

Still, as indicated below, a number of the following departments from several offices and ministries are involved in IWRM and integrated management in natural resources and environment:

- Under the Office of the Prime Minister: a) Office of the National Economic and Social Development Board, b) NWRC, and c) EGAT.
- Under MNRE: a) Pollution Control Department, b) Department of Marine and Coastal Resources, c) Department of Water Resources (served as ONWRC), d) Department of Environmental Quality Promotion, e) Office of Natural Resources and Environment Policy and Plan, and f) Department of Groundwater.
- Under MOAC: a) RID, b) Department of Fisheries, c) Department of Livestock Development, d) Land Development Department, e) Department of Agriculture, and f) Royal Forest Department.
- Under the Ministry of Interior: a) The Metropolitan Waterworks Authority, and b) The Provincial Waterworks Authority.
- Under the Ministry of Transportation: a) Thai Maritime Navigation Company Ltd.

MNRE, with its ONWRC, is supposed to be the main manager for IWRM. However, a number of agencies related to the water sector remain under the control of other offices and ministries. This implies that the NWRC under the Prime Minister's Office needs to be strengthened with management powers and sufficient and qualified staff to lead other lines agencies in IWRM, as stipulated in the National Policy and Action Plans.

The Bureaucracy Reform has just been started and its process may lead to the relocation of certain lower levels of the bureaucracy to appropriate ministries and departments. Discussions among the ministries and within each ministry are going on for completing the new setup in the ministries and in the provinces.

Thailand's Efforts in IWRM

Under the auspices of ONWRC and in cooperation with relevant agencies, i.e., NESDB and RID, a number of reform measures have been implemented and/or are being carried out. These include:

- The establishment of a comprehensive, unified water-management system for strengthening IWRM at national level and reorienting and reorganizing water-service delivery in irrigation, by reforming existing policy, legal and institutional framework.
- Decentralization of water-resources management in river basins, in which three river basins were selected for case studies.
- Formulation of a strategic plan for IWRM of all the 25 major river basins of Thailand.
- Preparation of action plans with a comprehensive work plan and budget estimates for pilot projects.

To cope with the inadequacy of qualified staff at various agencies, the ONWRC also put efforts in training, human-resources development and capacity building in the water sector and in introducing and implementing the IWRM concept to various agencies concerned. The most relevant example is the Capacity Building in Water Resources Sector Project during 2000-2001, which was funded by ADB (ONWRC 2001). The Project aims at developing the following:

1. A unified water-management system at the national level providing regulating rights to water, water allocation and distribution, licensing and costing of water extraction, penalties for illegal use, flood protection and relief.
2. ONWRC taking increased initiative to promote and increase cooperation among water-sector agencies and provide top-level support for the unified water-management system.
3. Active river-basin committees promoting stakeholders and multiagency involvement in the planning and development of basins.
4. RID reoriented and reorganized for services delivery and resources management adopting a participatory irrigation management approach and recovering a portion of its costs from users.

Water Resources Management and Lessons Learnt

Challenges in IWRM and Achievements

Although ONWRC has had some positive accomplishments during its four years of existence, it faces a number of serious constraints. Its mandate is not clear or appropriate to what the office should be doing, and is stated as regulation of the Prime Minister's Office, rather than in legislation. Its position, as a bureau under the Prime Minister's Secretariat, means that it does not get the type of management support needed and it is not seen as being equal to the other major water-related agencies, which it is seeking to coordinate.

NWRC and ONWRC have undertaken, and are still undertaking, several important tasks in coordinating water-resources management at both the national and the river-basin levels, including the following:

1. Capacity Building in Water Resources Sector Project in 2001 in cooperation with RID on:
 - Integrated Water Resources Information System.
 - A Strategy for Unified National Water-Resources Management.
 - Recommendations for ONWRC.
 - Decentralizing Water-Resources Management in River Basins.
 - Reorientation and Reorganizing Services Delivery Operations in Irrigation.
 - Administrative Issues.
2. Establishment of RBCs and Formulation of Pilot River Basin Projects:
 - Ten RBCs have been established, among 25 major river basins in the country, and the remaining are under formulation.
 - Two indicative plans formulated for two selected river basins.
 - Five pilot river-basin projects have been prepared with action plans and estimated budgets.

With regard to the RBC, it is observed that:

- a. The RBCs will need to work in an appropriate manner with the related agencies nationwide. A way will also need to be found to ensure that the river-basin plans, developed under the guidance of the RBCs and implemented by the national agencies, provincial and local governments, are practical and operational. The plans and projects, which are to be developed by the various national line agencies, will have to be coordinated with, and guided by, the established river-basin plans.
- b. The RBCs are new entities in the water sector. Their role in promoting integrated water-resources planning and management is parallel to that of the ONWRC at the national level. They should, therefore, be established, guided and strengthened by the ONWRC as well as being technically supported by other appropriate agencies such as RID. The challenge will be to strengthen the ONWRC itself, as well as establishing capable RBCs in a reasonable period of time and with the support and cooperation of the existing line agencies.
- c. Another question which needs to be resolved has to do with the role of, and relationship between, RBCs at the “greater basin” level, such as the entire Chao Phraya basin or Mekong basin, which is governed with the MRC regional treaty.

- d. According to the guidelines of the 8th National Plan (1996-2001), the development and conservation of both surface water and groundwater resources will be based on a systematic river-basin approach with regard to economic and social factors as well as to environmental impact. This approach is being implemented by the RBCs. However, a number of questions exist regarding the RBCs, including their membership, functions and method of operation, which need to be determined. Also their relationship to the ONWRC and to the national water-related line agencies (and their regional offices) as well as to provincial and local governments (particularly tambons, which will play a more significant role under the 1997 Constitution), also need to be established.

Relevant Lessons Learnt

The lack of efficient management of water resources has long been a major issue in Thai agriculture and other water-use sectors. Low efficiency of water use, especially in irrigation, as well as little emphasis on demand management, are the major factors affecting IWRM. Watershed management, water quality and poor information management are also other serious concerns. Agriculture is the largest user, and RID plays an important role in water-services delivery, but it is under MOAC, while ONWRC and the former Office of Accelerated Rural Development (OARD), which is responsible for providing water for domestic consumption, are under MNRE. Furthermore, other large water users such as EGAT, MWA and PWA are located under different roofs. This makes the tasks of NWRC and ONWRC challenging not less than before.

Experiences in Cambodia, Lao PDR, the Philippines, Sri Lanka and Viet Nam show that, as the apex body, NWRC should be clearly defined in its a) reporting line, b) mandate, c) structure and size, d) reform and strengthening of partner agencies, and e) and formation of river-basin committees and coordination with existing administrative structures. With the ongoing Bureaucracy Reform, it is a good chance that the NWRC and its office would be empowered with a clear and proper mandate and sufficient responsibilities to coordinate activities in the water sector for effective IWRM in Thailand.

On the other hand, the policy, legal and institutional framework is still incomplete, ONWRC and others are handicapped by a lack of qualified staff, and effective collaboration should to be achieved. ONWRC needs to be strengthened to provide the leadership and coordination required of an apex body. A water law has been drafted, but lack of political commitment to address a number of issues covered by the water law has meant that although works have been ongoing for several years on the law, it has yet to be passed.

The above is compounded by the fragmented approach to deliver, the absence of a clear water policy and regulatory instruments and the fact that a number of agencies and ministries, even much less than before, are still involved in the water sector.

Irrigation policy remains traditional and centralized government-control remains in place for all but small projects. There is no stakeholder participation, no transfer of responsibilities for management, O&M has been transferred to farmers and no progress has been made in introducing any cost recovery on most schemes. There appears little political interest in addressing these issues, which are considered to be unpopular. Public awareness of the issues, stakeholder empowerment and cost recovery will be critical for creating a changed environment for these issues. Affordability of cost recovery is also an issue, as is willingness to pay, and charges need to be set at levels that will still promote investment by individuals and communities in irrigated agriculture.

Prospects of IWRM in Thailand with a New Organizational Setup

Under the Bureaucracy Reform, a number of agencies related to the water sector have been grouped under the newly established Ministry of Natural Resources and Environment. However, there are still over 15 agencies under 5 ministries involved in water-resources development and management. Furthermore, some major water users, such as RID, EGAT, MWA and PWA, and resources-management agencies, i.e., Departments of Forestry and Land are still located outside of MNRE. This would need effective coordination efforts to achieve better management in natural resources, notably water resources. It is hoped that the current Bureaucracy Reform would look more carefully into these critical problematic issues in its process of resolving them at once for the betterment of IWRM.

Considering the water-management mandates of agencies and committees and institutional needs, the following improvements in IWRM should be implemented to fill in the existing gaps:

- *Water Resources Act.* As the basic legal instrument, the draft should be revised soonest, with the participation of all concerned parties, including NGOs, and it should be submitted to the parliament for approval and eventual enactment and application.
- *Policy and legislation.* Further policy development to provide guidance to agencies concerned.
- *Institutional development and capacity building.* The establishment and strengthening of river-basin committees and other agency reform and budgetary coordination in the water sector.
- *Data and information management.* Establishment of a coordinated, decentralized water-resources information system.
- *Planning.* The preparation and implementation of river basin master plans.
- *Approval procedures.* The procedures for approval of water-resources projects.
- *Water allocation management.* The appropriate allocation system, such as a bulk allocation, should be implemented.
- *Public participation.* Public participation should be through education, awareness and consultation process.
- *Operational responsibilities of parties concerned.* The development, management and operational responsibilities should be clearly defined and their performance monitored.

It is impressive that the Department of Water Resources is now serving as ONWRC. It gets a higher status, equivalent to other major water-related agencies, which would facilitate its work. However, the mandate of NWRC should be enhanced with more powers and defined clearly with regard to its role and functions in IWRM and monitoring of projects and activities implemented by water-resources agencies. For effective IWRM, basic requirements include a) an adequate legal mandate for ONWRC RBCs, b) development of a strong planning and dispute-resolution process, c) project approval, and d) monitoring of plan implementation and agency performance. In this

connection and, as has been discussed among the agencies concerned, the ONWRC could be restructured with the following main divisions in mind:

1. Policy, Coordination, and Foreign Relations.
2. Water Resources Planning.
3. River Basin Committee Development and Research.
4. Public Awareness and Consultation.
5. Interbasin and Watershed Development.

ONWRC will be the main supporting agency for RBCs and it needs to show a strong commitment to this responsibility in RBC development and research, and interbasin and watershed development. Better coordination with the regional institutions, such as, especially, an MRC is required as water-resources management in Thailand is governed by its water-related law and the 1995 MRC Agreement, for which Thailand is a signatory. It is noted that TNMC is now attached to the Bureau of Foreign Relations under the Department of Water Resources. This would facilitate the coordination in IWRM among various parties, at both the national and regional level.

Conclusions and Recommendations

From the above review and assessment of the water sector in Thailand, especially its efforts related to water policy and institutional development for IWRM, as well as the lessons learnt in the past decade, the following conclusions and recommendations can be made:

1. The Draft Water Act should be revised as soon as practical in line with the Bureaucracy Reform, with the participation of all concerned and submitted for legislation and enactment. The Act should set the main provisions and principles, and guidelines for which subsequent ministerial regulations will be established and amended at times to suit those prevailing conditions.
2. Under the ongoing Bureaucracy Reform, the mandate and responsibilities, as well the structure of NWRC and its ONWRC, should be further strengthened with a view to empower them with a clear mandate, role and functions, as well as proper authorities in overseeing the water sector and in implementing IWRM efficiently.
3. Implement the nine-point policy and priority action plans, together with the eight-point Joint Statement of the Ten Asian Nations for which Thailand is a party.
4. The capacity of ONWRC and water-related agencies should be enhanced and equipped with available best practices to effectively handle the IWRM issues and the subsequent implement plans.

5. When the Water Resources Act is enforced, revise the policy and develop priority action plans for water development and IWRM in accordance with the new Act and in line with NWRC's new mandate and structure.