Philippines

Country Water Resources Assistance Strategy

2003

The World Bank
East Asia and Pacific Region

Acknowledgment

This strategy paper was prepared by Douglas Olson (Task Team Leader; EAP Regional Water Adviser), Ahmed Shawky M. Abdel Ghany (Water Resources Engineer), and Robert Varley (Consultant).

Valuable inputs have been provided by Keith Oblitas, Mei Xie and Gilbert Braganza (EASRD), Vijay Jagannathan (EASUR) and Syed Husain, Benjamin Albarece and Ernie Wijangco (Consultants). The authors would also like to thank the Philippines counterparts for their feedback and for participation in the consultative workshop in Manila.

The authors also gratefully acknowledge the Bank-Netherlands Water Paretnership Program for supporting Regional and Country Water Resources Assistance Strategy preparation.

Contents

Abbreviations and Acronyms

AAA	Analytical and Advisory Assistance
ADB	Asian Development Bank
AFMA	Agricultural and Fisheries Modernization Act
APL	Adaptable Program Loan
ARCDP	Agrarian Reform Community Development Project (World Bank)
BFAR	Bureau of Fisheries and Aquatic Resources
BNWPP	Bank-Netherlands Water Partnership Program
BOD	Biological Oxygen Demand
BOT	Build-Operate-Transfer
BRBB	Bicol River Basin Board
BSWM	Bureau of Soil and Water Management
CAS	Country Assistance Strategy
CBRMP	Community Based Resources Management Project
CDD	Community Driven Development
CIS	Communal Irrigation System
CPAP	Conservation of Protected Areas Project
CWRAS	Country Water Resources Assistance Strategy
DA	Department of Agriculture
DAO	Department Administrative Order
DAR	Department of Agrarian Reform
DBM	Department of Budget and Management (of NEDA)
DBP	Development Bank of Philippines Natural Resources
DENR	Department of Environment and Natural Resources
DILG(U)	Department of the Interior and Local Government (Units)
DOF	Department of Finance
DOH	Department of Health
DOJ	Department of Justice
DPWH	Department of Public Works and Highway
DSWD	Department of Social Work and Development
EAP	East Asia and Pacific
EASRD	Rural Development and Natural Resources Sector Unit of East Asia and Pacific
EASUR	Urban Development Sector Unit of East Asia and Pacific
EMB	Environmental Management Bureau
EMS	Environmental Management System
EO	Executive Order
ET	Evapotranspiration

FAO	Food and Agriculture Organization
GEF	Global Environment Facility
GoP	Government of Philippines
IA	Irrigation Associates
IFC	International Finance Corporation
IMT	Irrigation Management Transfer
IOSP	Irrigation Operations Support Project (World Bank)
IP	Indigenous People
IRA	Internal Revenue Allotment
IRR	Implementing Rules and Regulations
ISF	Irrigation Services Fee
IWMI	International Water Management Institute
IWRM	Integrated Water Resources Management
JBIC	Japan Bank for International Cooperation
JICA	Japan International Cooperation Agency
LGC	Local Government Code
LGU(s)	Local Government Unit(s)
LIL	Learning and Innovation Loan
LLDA	Laguna Lake Development Authority
LWUA	Local Water Utilities Administration
M&I	Municipal and Industrial
MIS	Management Information System
MRDP	Mindanao Rural development Project
MU	Management Unit
MWCI	Manila Water Company
MWSI	Maynilad Water Services Incorporated
MWSS	Metropolitan Waterworks and Sewerage System
NCIP	National Commission of Indigenous People
NEDA	National Economic and Development Authority
NIA	National Irrigation Administration
NIS	National Irrigation Systems
NPC	National Power Corporation
NRM	Natural Resources Management
NWRB	National Water Resources Board
OED	Operations Evaluation Department
O&M	Operation and Maintenance
OP	Operational Policy
OP	Office of the President

PAGASA	Philippines Atmospheric, Geophysical and Scientific Administration
PAMB	Protected Area Management Board
PHRD	Policy and Human Resources Development Fund
PIDP	Participatory Irrigation Development Project
PIM	Participatory Irrigation Management
PMO	Project Management Unit
POs	People Organizations
PPDC	Provincial Planning and Development Coordinators
PRSP	Poverty Reduction Strategy Paper
PSP	Private Sector Participation
RBM	River Basin Management
RBO	River Basin Organization
RBWMP	River Basin and Watershed Management Project
RDC	Regional Development Council
RWRA	Regional Water Resources Adviser
SBMA	Subic Bay Management Authority
SIL	Specific Investment Loan
SMU	Sector Management Units
SWIMP	Small Water Impoundment Project
TA	Technical Assistance
TFs	Trust Funds
TWG	Technical Working Group
UNDP	United Nations Development Program
UP	University of Philippines
USAID	United States Agency for International Development
WATSAL	Water Sector Adjustment Loan
WDs	Water Districts
WDDP	Water District Development Project (World Bank)
WMC	Watershed Management Council
WMIC	Watershed Management Improvement Component (sub of the WRDP).
WRDP	Water Resources Development Project (World Bank)
WRM	Water Resources Management
WRSS	Water Resources Sector Strategy
WS&S	Water Supply and Sanitation
WTP	Willingness To Pay
WWTP	Waste Water Treatment Plant

I. Introduction and Background

1. The Philippines is a graphic illustration of one of the central themes emerging from a recent Word Bank (the Bank) review of implementation of the 1993 Water Resources Management Policy by the Bank's Operations Evaluation Department (OED)—*"Progress takes place more through 'unbalanced' development than comprehensive planning approaches and…institutional development efforts should abandon comprehensiveness of scope and schedule and a partial, cumulative, and highly focused approach [should be] pursued*."[1] This argument ascribed to both the Water Resources Management (WRM) related advantages and disadvantages of a democratic and decentralized system of government. Earlier efforts at WRM reform and the establishment of an apex organization have been less than successful in the Philippines.

2. A more selective strategic approach is needed which recognizes the existing political-economic realities, keeping in mind that decentralization itself facilitates experimentation if there is local political and community support for change. The Government of the Philippines (GoP) policy is not to promote new institutions, but instead reform and streamline existing ones as far as possible and improve coordination. In a recent review of Bank support of WRM in the Philippines it was concluded that *"In the future the Bank needs to be more opportunistic, and go where there are immediate needs for reforms and there are mobilized actors who want to make the changes happen."* This strategy is directed at improving water resources utilization and management consistent with GoP policy with emphasis on strengthening decentralized institutions and management capability.

1. OED publication, Bridging Troubled Waters (2001).

The Bank's Conceptual Framework for Integrated Water Resources Management

3. In 2003 the Bank's Board *approved* a Water Resources Sector Strategy (WRSS) which supports implementation of the Bank's 1993 Water Resources Management Policy[2] using the experience updated internationally with water resources development and management. The core conclusions elaborated in the WRSS are:

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

- The main management challenge is not merely a vision of integrated water resources management but also a *"pragmatic but principled"* approach;

- The Bank's water assistance strategy must be tailored to a country's circumstances and be consistent with its Country Assistance Strategy (CAS) and Poverty Reduction Strategy Paper (PRSP);

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

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

2. The 1993 policy suggested: 1) using river basins as planning and management units; 2) linking land use management as an integral part of sustainable water management; 3) recognizing water as a scarce resource, with an economic good as well as social good nature, and promoting cost effective interventions that are self financing at least for operation and maintenance; 4) supporting participatory approaches, including managing water and related basin resources at the lowest appropriate levels; and 5) focusing on actions that improve the lives of people and the quality of their environment.

- The WRSS emphasizes coordinating initiatives between water-using sectors, focusing on integrated management to ensure optimal sustainable use, development, and environmental protection.

4. The conceptual framework for water management, as proposed by the Global Water Partnership distinguishes between 5 user-sectors which are represented by the "teeth" of the comb in Figure 1. The WRSS emphasizes the importance of coordinating initiatives in the individual water-using sectors by focusing on integrated management to ensure optimal sustainable use and development of water resources, and environmental protection. The WRSS further elaborates that Integrated Water Resources Management (IWRM) means dealing with:

- **Institutions** that affect the quantity and quality of water resources through international, national and state resource management agencies, river basin and aquifer agencies and therefore the definition and establishment of laws, rights and licenses; the responsibilities of different actors; standards for water quality and service provision (especially to the poor); the environment, land use management and the construction and management of infrastructure.

- **Management Instruments,** including regulatory arrangements, financial instruments; standards; plans; mechanisms for effective participation of stakeholders; and knowledge and information systems that increase transparency and accountability, motivate effective water allocation, use and conservation, and secure maintenance and physical sustainability of the water resource systems;

- **Development and Management of Infrastructure** for annual and multi-year flow regulation, for floods and droughts, multipurpose storage, and for water quality and source protection; and

- **The political economy of water management and reform,** in which there is particular emphasis on the distribution of benefits and costs, on poverty alleviation, and on the incentives including water pricing which could encourage or constrain the more productive and sustainable resource use.

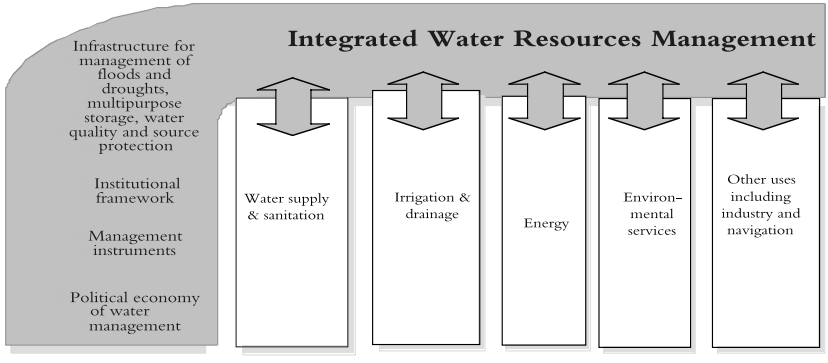
5. The different IWRM issues relate to the *"handle"* of a *"comb"* (see Figure 1) and the "teeth" represents sectoral activities such as water supply and sanitation, irrigation and drainage, energy and environmental services. The Philippines Country Water Resources Assistance Strategy (CWRAS) is not a comprehensive strategy for each of the sectors or *"teeth,"* but rather a broad WRM strategy that addresses some aspects of the sectors where needed, as they relate to WRM.

6. Both the Philippines and the Bank share a common commitment to the 3 Dublin Principles adopted by the international community in 1993 as a basis for future water policy:

- The **ecological principle**—water should be managed comprehensively (and not by independent actions of water using sectors) within the context of the river basin as the management and development unit. The river basin must be the basic unit of analysis with special attention being paid to the environment;

- The **institutional principle**—WRM is best done when all stakeholders participate and actions should be devolved to the lowest level possible (the subsidiary principle); and

Figure 1—Integrated Water Resources Management



- The **instrument principle**—water should be managed as an economic good or scarce resource—incentives and economic principles are to be used in improving allocation and enhancing water quality.

Background on the Water Institutions in the Philippines

7. Water resources management in the Philippines is arranged around 17 major river basins, designated as water resources management and planning units. An interesting statistics is that there is a concentration 7 of the 10 biggest units in Luzon Island. Conflicts in water demand for irrigation and domestic and municipal uses are projected for 4 of the 12 water resources regions and anticipated environmental needs will add a 5th (Mindanao). Overall supply of water is three times annual use but there are serious seasonal and geographic shortages, not ameliorated by the high cost of developing storage.

8. Water supply in approximately 1500 Local Government Units (LGUs) is managed either by the autonomous Water Districts (WDs, about 300) or municipal departments in the LGUs (about 1200). Metro Manila water supply is managed by the Metropolitan Waterworks and Sewerage System (MWSS). Although WDs are empowered to develop sewerage infrastructure, there is very little sewerage development in the Philippines (about 10% of MWSS area, and small systems in two or three secondary towns).

9. Water has become a critically constrained resource in some regions of the Philippines (particularly in the areas around Manila and Cebu), threatening socio-economic development. Compounding the problems are:—(i) the pollution of surface water caused by untreated municipal and industrial wastewater, and (ii) significant clogging of municipal drainage infrastructure caused by poor maintenance. Greater coordination and consistency between the WRM aspects and water supply management are urgently needed. This must be achieved in a context of three major user sectors—irrigation (about 80% of water use), Urban Municipal and Industrial (M&I, about 15%), and the environmental. The environmental need is normally considered a public good—allocation is

not driven by market mechanisms but by political and ecological considerations. The irrigation sector is dominated by strategic food issues, socio-economic and political pressures as well as urban-rural relations.

10. The GoP now recognizes that WRM should be a top priority—*"the Macapagal-Arroyo Administration is committed to formulating and implementing effective measures to resolve water shortages through, among others, exploring the feasibility of the transfer of water rights and water allocation needs to address the scarcity problem in a rational and fair manner and prevent substantial losses to the economy."*[3]

11. The National Water Resources Board (NWRB) is responsible for the administration and enforcement of the 1976 Water Code, which is the legal framework for WRM. NWRB's mandate extends from regulation and exploitation, to conservation and protection. Other major institutional stakeholders are the (i) Department of Environment and Natural Resources (DENR) responsible for watershed management and water quality; (ii) National Irrigation Administration (NIA, under the Department of Agriculture DA) responsible for construction and management of irrigation systems; (iii) Local Government Units (LGUs), which after the passage of the Local Government Code of 1991 have significant powers vested in them; (iv) Irrigation Associations (IA) responsible for irrigation operations and development; (v) Local Water Utilities Administration (LWUA) which finances and oversees autonomous Water Districts (WDs, whose Board members are appointed by Mayors); (vi) MWSS which serves Metro Manila with water supply and sanitation services; (v) private providers of water supply in Metro Manila, Subic Bay, LGUs and housing subdivisions ; (vi) Department of Public Works and Highways (DPWH) for flood control; (vii) Bureau of Fisheries and Aquatic Resources (BFAR) under Department of Agriculture, responsible for inland fisheries; and (viii) National Power Corporation (NPC) responsible for hydropower development and operations. NEDA, the National Economic Development Agency is the highest policy making body and has overall coordination responsibilities

3. NEDA website, January 31, 2002.

for development, including water resources. The Department of Interior and Local Government (DILG) assists the LGUs in supplying water to many small towns, with the oversight by LWUA in some cases.

12. NWRB was mandated by the Water Code of 1976 with coordinating WRM activities at the central and regional levels, involving more than 20 departments, government corporations and bureaus, as well as numerous regional and local entities. NWRB, however, has a small staff, limited financial resources and no regional presence. NWRB governance has been responsive in the past to the needs of the large GoP agencies, such as LWUA, NIA and MWSS, rather than to the final users of water resources. It has been unable to fulfill all of its mandate, concentrating mainly on the approval (but little enforcement) of water rights in the region around Manila. The Water Code (1976) has been weakly enforced and NWRB has been unable to mediate conflicts in water demand, and provide sufficient planning and coordination of WRM. NWRB's original location under DPWH created a conflict of interest between its water resources planning, management and regulation roles, and the development function of a public works ministry. The original NWRB was governed by water-users such as LWUA, NIA, MWSS, NPC and was chaired by DPWH.

13. The NWRB was transferred from the Department of Public Works and Highways to the Office of the President in 2002 by virtue of Executive Order No. 123 with provision for further transfer to DENR. The Board was reconstituted to include agencies which are non-claimant to the resource (DENR as Chair, NEDA as Co-Chair and Department of Health (DOH), Department of Finance (DOF), Department of Justice (DOJ), and University of Philippines (UP) National Hydraulic Research Center as members. In theory this is a welcome move, since the DENR oversees the environmental issues in the Philippines and because of the public good nature of environmental concerns, which must be addressed, while at the same time developing sustainable policies for the management and regulation of water resources to meet the needs of competing uses. DENR with its regional presence can strengthen NWRB's field presence through the use of its branch offices organized on a river basin or regional basis. But this requires consider-

able technical assistance in both NWRB and DENR, and requires strengthening of the (regional) oversight capacity of DENR. DENR has already initiated a variety of approaches and strategies for watershed management and WRM; NWRB must fit into this configuration. The DENR's Department Administrative Order 2001-29 (DAO 2001-29) has established some coordination between the offices involved in watershed management and WRM activities. NWRB will find it difficult to assume immediate responsibility for IWRM. Apart from the Laguna Lake Development Authority (LLDA) near Manila, there is no other functioning basin-like institution with enforcement powers. There is an almost complete absence of strong and effective river basin institutions—even LLDA has undertaken few WRM activities beyond collecting pollution charges. The relationship between NWRB and river basin institutions is unclear, and either NWRB must be strengthened or a more autonomous, statutory body be established. This body (which could be NWRB) will need to develop into assuming the role of—*"an independent authority with sufficient powers and resources that will formulate national policies on water resources management, regulation (quantity, quality, economic and service efficiency), utilization, planning and conservation."*

14. The two largest user sectors are irrigated agriculture and water supply and sanitation/sewerage (WS&S). Irrigation of a total service area of some 1.4 million hectares, primarily of irrigated rice, is divided into Communal Irrigation Systems (CISs), National Irrigation Systems (NISs) and, to a smaller extent, private irrigation systems (through groundwater pumping and small rainfed water impoundments). NIA fulfills many functions of a traditional water resources or irrigation ministry but is established as a financially independent body, largely dependent on irrigation service fees for its current revenues. NIA has been associated with a widespread reform program of Irrigation Management Transfer (IMT) and has wide operational responsibilities for NISs.

Bank Assistance

15. The Bank chose the Philippines for the first round of consultative visits to support formulation of its global WRSS. The preparation process comprised:

- A 2-day consultation workshop with stakeholders in the Philippines in 2000; (workshops were also held in Yemen, Brazil, Nigeria, India, as well as in the Hague, London and Washington D.C.).

- An internal Bank process engaging both country and regional management teams. The Bank process has been an input both to the overarching Country Assistance Strategy (the framework for Bank engagement in the Philippines) and the CWRAS.

16. The Bank's WRSS process required that in FY2002 a CWRAS be produced for a key country in each of the Bank's six global regions. For the East Asia and the Pacific (EAP) Region, a China CWRAS was prepared in FY2002. The purpose of the CWRASs is to develop strategies to coordinate and prioritize Bank assistance to the borrowers, and to assist them to address the broad range of WRM issues. The Philippines CWRAS is one of a second cohort of CWRASs being prepared by the Bank's six regions during FY2003, using the focus country analyses as a starting point. In November 2002, a Bank mission visited the Philippines to initiate preparation of the CWRAS and make field and office visits to obtain the views of Government agencies and others on the Bank's existing programs, assess the project pipeline and how the Bank could improve its assistance. The 2000 consultation workshop and the meetings and documents collected during the November 2002 mission provide a basis for analyzing the existing WRM situation in the Philippines.

17. The Bank's comparative advantages are advocacy, supporting the implementation of ideas on the ground and introducing best practices. This is how it has worked in the past in the Philippines and will in the future. IWRM in the long-term will require a combination of strengthening existing institutions and only if necessary creating new ones. Finding out what works and does not is a long-term process and the Bank needs to have a sustained commitment.

18. In the past, the Bank's sectorally fragmented approach to its Philippines water program reflected the organizational structure of the EAP Region of the Bank, and still does to some extent. For operational purposes EAP is organized by "sector management units" (SMU)—Infra-

structure (which includes the Energy, Transport, Urban Development and Water Supply Sector Units), Rural Development and Natural Resources, Environmental and Social Development, Human Development, Poverty Reduction and Economic Management, and Private Sector Development. The SMUs all have programs that include water related activities. One consequence of the WRSS has been that EAP recently established a water team coordinated by a Regional Water Resources Adviser (RWRA). The team includes the SMU directors and the professional staff within the units who have water-related responsibilities. Staff are geographically dispersed between HQ and country units but can communicate easily through the Bank's MIS system making it a *"virtual water team."* The RWRA and the water team have overall responsibility for improving the coordination and quality of water-related activities throughout the region and particularly to support to water activities in client countries

19. The Bank's CWRAS is intended to complement and support GoP's own policies and strategies. The 1976 Water Code reflects the past efforts to bring a more holistic perspective, and Philippine policy and laws are in general supportive of IWRM. However, the main challenge has been to implement the policies through a large and widely fragmented set of institutions responsible for different aspects (see para 11). Broadly these institutions can be divided into those concerned with delivering water services and those that focus on management of water as a resource. Some of these largely public institutions, such as NIA and LWUA are struggling to survive in a more fiscally constrained environment. The government's policy is to decentralize implementation and operation responsibility to LGUs and to transfer many infrastructure service functions to the private sector, while developing a sound regulatory structure. There is a recognition that the central agencies' role must change from one of national water resource development and central control to a redefined role that emphasizes water resources policy, regulation and strategic management, with WRM at the river basin level and water services delivery decentralized. Consistent with this, the Bank should support GoP efforts to downsize public agencies to match newly defined responsibilities. Two key issues have emerged:—(a) finding alternative employment opportunities for those made redundant; and (b)

identifying those individuals who have valuable skills and who should be transferred to other agencies, employed by the private sector, or become consultants to water-user groups. The Bank should also support the investment in the sector at the decentralized level linked with the reforms required.

20. The Bank has provided assistance to GoP in preparation for the Third National Water Conference in 2003. This Conference has not yet taken place, having been repeatedly delayed for a variety of reasons, but has strong political backing from the present Philippine Administration. The Bank is widely perceived to be an honest broker with worldwide experience and access to expertise; it can be a very effective partner for the open dialogue and debate at all levels, needed for effective strategic reform of Philippines WRM. The background papers prepared by GoP for the Conference have been utilized in this strategy document. The CWRAS supports GoP strategy as outlined in the Conference background papers.

CWRAS Strategic Framework

21. The Bank's CAS goals for the Philippines are to speed up poverty reduction through rapid, sustainable and equitable growth, addressing regional disparity, and enhancing rural income and well-being (access to land tenure, extension services, rural infrastructure and credit). In regard to water, the CAS-related goals are to: contribute to enhancing the productivity of the agricultural—including aquaculture—sector; provide potable water of good quality to urban and rural households; improve governance (including finance and judiciary) in relation to water services and WRM; protect river basins and their watersheds and improve cross-sectoral water resources management.

22. Before the issuance of the GoP Local Government Code (1991), donor-project proposals for the water sector were infrastructure oriented, with less attention to institutional and management long-term needs. The CWRAS fits within the mold of more recent experiences, including such policy documents as:

- the CAS;

- the GoP's revised medium term development plan (2001-2004); Local Government Code; and the other water-related laws (e.g. Agriculture and Fisheries Modernization Act AFMA 1997) and umbrella legislations;

- the Bank's new Rural Development Strategy for the EAP Region, which recommended that: "capacity building efforts need to be institutionalized and would need more time than the usual lending period, if sustainable outcomes and impacts are to be achieved";

- the Bank's new WRSS which builds on the implementation experience of the Bank's 1993 Water Resources Management policy.

23. The CWRAS also fits within the *overall rural development and watershed management CAS goals* thus integrating with the other Bank/donor projects for improving equity by targeting small farm holders, upland-watershed inhabitants and migrant farmers, (inland-water) fisher-folks, and women. Tools include decentralized development and CDD, and the CWRAS is aligned with the GoP's decentralization policy for delivery of services, including LGUs and local communities as co-implementers of development and management.

24. WRM is not a sector although it is often mistakenly referred to as if it were one—the distinction between IWRM and the user-sectors is conceptual. Like the environment and poverty, **"water resources management" is increasingly used as an overarching theme** or, *"pillar"* of development which should be *"mainstreamed"* in many Bank projects. Complementary themes, which apply particularly to the Philippines, are decentralization, poverty alleviation and community driven development (CDD). CDD is more familiarly known in the Philippines as *"community-based"* or *"participatory development."*[4] Decentralization in the Philippines has been guided by the landmark 1991 Local Govern-

4. Examples are community-based programs for (a) Irrigation Management Transfer (IMT); (b) Forestry Management; and (c) Forest Regeneration.

ment Code (LGC), which devolved many functional responsibilities (corresponding to expenditure assignment) to local government units or LGUs. The CWRAS needs to be consistent with both the LGC and CDD goals. Both should help LGUs improve the quality of water service delivery by increased accountability and demand responsiveness. A new challenge is the institutional transition from centrally-based and funded line agencies such as NIA, to more autonomous regional entities (such as river basin authorities) that have diverse stakeholders (e.g. LGUs and private sector enterprises) which are located within hydrological rather than administrative boundaries. Not only must the existing basin-wide institutions be modified and in some cases new ones established, but corresponding financing and regulatory mechanisms have to be developed more or less from scratch.

25. Greater coordination and consistency between water resource and environment management, the water supply and sanitation sector and the irrigation sector is an urgent need. The Bank should emphasize support of decentralization and CDD in its WRM assistance to the Philippines. WRM needs to be carried out at the river basin level with the direct active participation of local governments, water users and other stakeholders. Institutional and financial mechanisms that focus on water being an economic good need to be developed and strengthened, so that allocation between competing uses is made based on transparent criteria that have LGUs fully engaged in the process.

26. The CWRAS identifies the Philippines principal water resource challenges, the current situation, how the Bank is assisting at present, and what it should do in the future. The CWRAS reflects the Bank's overall water strategy which can be summarized as follows:

- Water resources management improvements are a long-term endeavor, and the Bank should provide assistance to Philippines in translating the rhetoric of water conservation and sustainability into practical-realistic programs and policies;

- The Bank should focus on (i) promoting cooperation of LGUs and water users themselves, and (ii) following a "bottom-up and top-

down" approach that includes the active participation of water users, with emphasis on CDD. The Bank should also work with the Government to develop both infrastructure and management into water resources projects;

- Water resource management initiatives should respect existing local cultural practices which have evolved to provide sustainable and stable water resources management in a micro-watershed context. Indigenous water systems provide clues to how WRM should be rooted in the socio-cultural context, which has greater potential for establishing ownership and hence sustainability; and

- The Bank should give priority to supporting the use of economic instruments in managing river basins, facilitating private sector participation in the WS&S sector, and supporting the decentralization of responsibilities for WRM. Projects should be designed within a basin-wide or regional water resources perspective, so that the economic costs and benefits of different options are fully understood by local residents before decisions are taken by them. For this to occur three groups of stakeholders needs to be fully engaged: the national agencies and local governments, e.g.; NIA and LGUs (as owners of the water resources system and water rights); the water, irrigation and sewerage and drainage local/community institutions (as operators of the services); and residents (as beneficiaries of services). Planning, monitoring and managing of water allocations, watershed management, poverty reduction, environmental protection and restoration of rivers, wetlands, lakes, and coastal waters need to be undertaken keeping in view that water is a finite resource.

27. Lending assistance for physical infrastructure will continue to be the vehicle on which to build new "software," while integrating the particular project within basin-wide management. Sub-components should address the full range of water issues including financial, environmental, agricultural and social objectives. Increased Bank Analytical and Advisory Assistance (AAA) should be mobilized in parallel with the investment program, as such work can directly impact on the benefits from infrastructure and determine the quality of management. A tight fiscal situa-

tion mitigates against the size of past loans but Bank projects should include funding for innovative pilots. The goal is that investments should eventually be driven by demand, and managed by institutions responding to financial and social objectives at the river basin and LGU levels. In accordance with the GOI decentralization objectives and the CDD approach, the Bank should seek to develop new lending mechanisms to enable closer partnership with LGUs for project implementation. In such a future environment central agencies such as the LWUA could continue to provide technical assistance and other support.

28. The key audiences for this CWRAS are fivefold:

1. The GoP agencies most concerned with the preparation for the upcoming Third National Water Conference—namely the NEDA (National Economic and Development Authority), NWRB (National Water Resources Board) and DENR (Department of Environment and Natural Resources);

2. The other water-related line agencies, e.g., DPWH, NIA, LLDA, MWSS, and LWUA; the (planning departments of) municipal and provincial governments; and the water-user groups including Water Districts and Irrigation Associations;

3. The World Bank—both the Country Department and the Water Resources Management Group (WRMG) responsible for developing the WRSS/CWRAS.[5] The Country Department prepares the Country Assistance Strategy (CAS) while WRMG is responsible for bringing coherence to the Bank work on water across the resource and service spectrum, and enhancing quality;

4. Philippine civil society, People Organizations (PO), private sector, and academia participants, who may be interested in engagement in operating, managing or financing water services and infrastructure. Community and NGO groups will be participants and part-

5. The Bank-Netherlands Window for Funding Country Assistance Water Resources Strategies has provided funding for preparation of this document.

ners in the Philippine National Water Resource Management Strategy that will emerge from the upcoming National Water Conference; and

5. The bi-lateral and multi-lateral donors who are important partners in the Philippines as well as members of the Global Water Partnership. The CWRAS should focus and strengthen ties and linkages to these donors.

II. The Philippines' Water Resources Challenges and Government Focus

29. The Philippines has some major water resources issues: localized raw water shortages, flooding, water pollution, over-exploitation of groundwater (particularly in and around the larger cities) and overuse of surface water resulting in inadequate environmental flows for major basins and sub-basins. Water quality problems include increasing groundwater and surface water pollution (organic and inorganic) in many parts of the country, damaging both freshwater and coastal environments. Flooding is a major problem and damages have increased in recent years because of deteriorating watersheds, and high economic and population growth. Watersheds and upper catchments have been degraded because of pressures of marginal agricultural activities resulting in deforestation and inadequate agricultural and soil management practices.

30. The principal challenges for the Philippines are to maintain high-levels of economic and social development and at the same time to promote existing instituions to better support WRM in the context of devolution of powers and increased community participation. The objectives of water resources development and management are to:

- devise and implement workable mechanisms for managing competition between uses including the reallocation of water from irrigation to M&I uses in water scarce regions;
- preserve the environment, restrict and control surface water pollution;
- stabilize watersheds, increase levels of flood-protection and halt groundwater overexploitation and pollution;
- provide a better service and make more efficient use of water in satisfying municipal and industrial demands;

- improve the efficiency and management of irrigation through modernization and institutional reform;

- improve the rural quality of life through stimulating economic activity and agricultural productivity; and

- strengthen traditional social mechanisms to contribute to sustainable WRM.

31. Water has become a major constraint to continued growth and development of urban areas such as Manila and Cebu. Without a strong commitment to improve water resources and environmental management, the damage to the Philippines natural resources could become irreversible, resulting in huge negative impacts on the quality of life of the people and on the economy in the future. Water reforms in the Philippines are underpinned by the level of environmental awareness, participatory institutions and a market economy. Depleted and degraded groundwater resources in major cities must be addressed by effective regulation or they will simply become unusable. This will add to M&I water demand which is being partially met by frequently unregulated private and industrial tubewells. Within cities a major area for public intervention will be improving sanitation/sewerage and the access of the poor to affordable water supply and sanitation services. Cross subsidization through block tariffs and targeted subsidies to establish connections are the main financial instruments under consideration. The Bank is well placed to provide assistance to the Philippines in meeting these challenges by better mobilizing and coordinating international experience and assistance in the various aspects of sustainable WRM and development. In the words of a participant in the 2000 consultation workshop, *"The Bank has a unique structure for policy assessment and should use this more systematically, as the benefits are great and should not be limited to water professionals."*

III. General Strategic Themes

32. The overall strategic objective is to improve water resources management. This objective and the general themes described below are all in line with the GOP and Bank policy. **A critical unsolved problem for the Philippines is inadequate water resources management, or more accurately ineffective/fragmented water management systems.** The 1976 Water Code is good foundation for addressing this problem, and the Bank should intensify its support for implementing it.

Theme 1: Sustainability—The environment, the land and the water resource base must be preserved for future generations.

33. Water resources planning, development and management need to provide for ecological protection and sustain the environment. Local development plans should incorporate IWRM as a mandatory component of investment strategy. This requires more long-term approaches and better scientific and technical input and needs to take into account possible changes in the water resources availability and variability brought about by climate change. Comprehensive water resources planning should take into account environmental needs and specifically carry out water balance, water allocation, and water quality management/ determinations considering specific provisions of adequate quality water for environmental flows in rivers and coastal zones (including those needed to counteract salinity intrusion), and to sustain ecologically important areas. In the case of groundwater, extractions should be limited to sustainable yields. Water resources development and management should therefore be founded upon a firm environmental sustainability base. The Bank needs to work closely with the Philippine counterparts to ensure that environmental sustainability is not just addressed through required environmental assessment analyses, but is an integral part of national, basin and project planning, as meeting environmental needs is a primary objective of water resources planning, development and management. This should include:

- allocating water for environmental purposes and controlling the other uses to ensure that these allocations are met;

- controlling of point and non-point sources of pollution in lakes and rivers, taking into account the assimilative capacity of such water bodies; and

- preservation and management of coastal zones, marine and inland fisheries, upland forestry, marches/wetlands, and their habitats. One third of the Philippines population lives in marine environments. Some of these are upland/volcanic-like watersheds, others encompass Mangrove and aquaculture environments.

With the help of international experience and through AAA work, the Philippines can find successful approaches to achieving sustainable utilization of water resources and environmental protection within its water resources program.

Theme 2: Implementation of Policies—More money, government attention and international knowledge are needed to address the management side of water resources issues.

34. A key strategic thrust in the Philippines should be more water resources management investments because they generally have high returns in conjunction with infrastructure investments. The relatively low level (small numbers) of storage infrastructure (reservoirs and tanks) in the Philippines is a reflection of their high cost. The level of physical infrastructure development funded by the GoP should in the future reflect the level of development of each regional planning area—in most locations the physical infrastructure is in need of better O&M and rehabilitation/modernization. The marginal returns from rehabilitation/modernization and additional infrastructure investments are high in some areas and diminishing in others ($\$/m^3$ development costs increase as the most favorable sites are used up). In the long-term there is still 1.5 million hectares of potentially irrigable land and depending on the progress of WRM reform the Bank may in the future finance

high-risk high-reward new hydraulic infrastructure. Given the current macro-economic fiscal constraints, investments in new hydraulic infrastructure (e.g., for expansion of irrigated areas) will be limited and more attention needs to be given to water resources management investments in conjunction with rehabilitation/modernization and in some cases new hydraulic infrastructure. Box 1 lists examples of different types of "water resources management investments."

Box 1. Water Resources Management Investments

Examples of Studies and Surveys:

- Aquifer Characterization
- Flood Plain Mapping
- Rainfall-Runoff Studies
- River Basin Planning
- Basin Consumptie Use Studies
- Water User Inventories
- Wastewater Flow and Quality Field Studies
- Local Water and Land Planning
- Output Based Subsidies to address poverty concerns in WS&S projects

Examples of Monitoring, Measurement, and Modeling:

- River Flow Monitoring
- Water Quality Monitoring
- Municipal and Industrial Discharge Monitoring
- Regional Groundwater Monitoring
- Irrigation Scheme Water Distribution
- Measurement of Diversions and Extractions
- Satellite Imagery
- Hydrologic and Hydrodynamic Models
- Reservoir Optimization Models
- Socio-econmic Models
- Decision Support Models
- Demand Estimation

Examples of Institutional Development and Capacity Building:

- River Basin Councils & Agencies
- Groundwater Units & Aquifer Committees
- Measurement and Volumetric Charging
- Demand Management
- Water Rights Administration
- System of Tradable Water Rights
- Water User Associations
- Operation, Maintenance and Management of Infrastructure
- Utility Regulatory Commission
- Mass-Based Pollution Discharge System
- Financing of Municipal Infrastructure
- Public-Private Utility Partnerships
- Flood Management Agencies
- Training and Study Tours
- Water Corporations
- Financial Management of Infrastructure

35. Management investments when well designed and implemented with the support of the Bank can bring major benefits. However provincial and local governments are reluctant to borrow for upgrading water resources management since so many of the benefits are externalities. But there are many examples of high-return investments in management. Some examples include: (a) optimal management of hydraulic infrastructure including flood control facilities utilizing computerized decision support systems; (b) modeling to optimize conjunctive use of surface and groundwater; (c) demonstrating how to reduce non-beneficial evapo-transpiration and thereby satisfy water demand while making more water available for environmental purposes; (d) establishing and implementing a system of water rights and discharge control; (e) water savings by volumetric measurement and water pricing. Use of significant amounts of government financial resources and Bank lending resources for investments in management are justified, and when these investments have public-good characteristics, subsidies (or less than full cost-recovery from water users) become appropriate. The GOP national government has in the past requested bilateral grant support or provided minimal amounts of counterpart financing for non-infrastructure related activities.

Theme 3: Coordination—at all levels in order to accelerate and deepen water management reforms.

36. Political support is essential to implement water sector reform but with Government primarily as facilitator. Water resources are not a conventional sector and more than 30 agencies are involved with various aspects. Without dedicated political commitment, fundamental institutional and management reform is difficult. With the backing and facilitation of political leaders at all levels and the national Government, the Bank can work to promote more dialogue on institutional and organizational issues related to WRM. In the Philippines there is a strong need to establish a framework with river basins as the management unit that permits mayors in neighboring LGUs to discuss and reach agreement on WRM issues.

37. There is a strong need for increased coordination and cooperation between various government entities, water user groups and other stakeholders. Individual sectoral agencies still have to play an important role in implementation of a new WRM agenda, but the role will need to shift from operations and investments which should be decentralized, and to more on management support. Creative leadership will be required to overcome these challenges. Political commitment is also required to ensure that the financial burden related to improvements in WRM is not imposed entirely on the pilot projects and programs and on associated LGUs. However, decentralization should not increase the transactions costs of WRM.

38. Harmonization is also needed with the programs of bilateral and multi-lateral donors/lenders. Box 2 presents areas where harmonization would bring about a value added.

Box 2. Cooperation between bilateral and multi-lateral donors/lenders

- ADB and JBIC have both had irrigation projects containing turnover components. The Bank has the largest involvement (WRDP covering 85,600 ha and IOSP-II covering 96,400 ha). ADB and JBIC have been facing complex institutional dilemmas regarding the need to organize farmers, restructure NIA, and address the institutional spillovers post transfers. The Bank, ADB and JBIC need to coordinate their support for the rehabilitation of old/existing irrigation systems, irrigation reform including irrigation management turnover, and NIA streamling.
- For the Bank-supported WRDP, JICA has been supportive in providing a TA-grant for NWRB to study the alternatives for augmenting the water supply to Metro Manila; WRM bottlenecks (WRM Master Plan); and the NIA-streamlining bottleneck. ADB assistance to MWSS has been evaluating alternative supply-oriented measures for augmenting the water supply to Metro Manila. The Bank, ADB and JICA need to coordinate their assistance to resolving the Metro Manila water supply issues including supply augmentation, and demand-management measures such as leak reduction and pricing, and dealing with non-revenue usage (clandestine taps and groundwater pumping).
- For water supply and sanitation the Bank and JICA have been involved in various provinces and should coordinate their assistance. For flood control/mitigation, the Bank is to support an optimal mix of structural and management

(non-structural) measures. JICA/JIBC used to support flood control using structural works, but, has recently diverted to supporting management measures (e.g., flood forecasting and warning systems) to reduce capital and social costs.

- The Bank and ADB need to coordinate their assistance on raw water pricing. NEDA approached the Bank to re-address raw water pricing, following an ADB preliminary TA study. It is important to address cross-sectoral insights on pricing methodologies (e.g. willingness to pay), administrative procedures (monitoring, billing, collection), public acceptance and possible conflicts, and methods for determining and implementing compensation for parties choosing to engage in various forms of water rights/transferring.
- There is a need for the Bank to coordinate its assistance with ADB and Dutch-donor programs that have been studying water utilization and pollution control for Laguna De Bay, through a combination of physical investments and management/capacity-building investments. Through an ADB-TA to MWSS, LLDA proposed that Laguna De Bay be considered amongst the primary options to augment water supply to Manila; MWSS has been reluctant in progressing towards that option. A problem has been how to balance water quality for different users. LLDA with a Dutch grant is undertaking a feasibility study for a proposed integrated project: construction of a polder-type shore-embanked reservoirs coupled with at-source control of industrial pollution and at-source treatment of domestic wastewater for the tributaries discharging into the western lake, thus enabling the private sector to treat and supply water from that side of the lake. Should that be successful, it could be replicated as many requests have been submitted to LLDA from neighboring LGUs. The Dutch-funded study indicated that the feasibility of such projects should usher a national-government commitment in backstopping LLDA to contract the project out to the private sector using BOT models.
- The Bank needs to coordinate with GTZ who has been funding big fisheries and pilot-WS&S projects.
- In relation to experimentation of modern water-saving and environment-friendly technologies, the Bank needs to coordinate with the initiatives of other donors. Of these, UNDP has been piloting Photovoltaic-pumping for domestic water supply and drip-irrigation of cash crops in uplands.
- Examples of exploring innovative resource management arrangement also include the United States Agency for International Development (USAID)-supported Natural Resource Management Project (NRMP) and an on-going Eco-Governance Project. Through the NRMP for example, the co-management of the Magat River watershed between the DENR and the provincial LGU was developed and implemented.

THEME 4: TOP-DOWN: BOTTOM UP—WATER RESOURCES MANAGEMENT NEEDS TO BE BOTH A "TOP-DOWN" AND A "BOTTOM-UP" UNDERTAKING, AS WELL AS BE A DYNAMIC, ITERATIVE, AND PARTICIPATORY PROCESS.

39. Water resources development/management needs to be both a "top-down" and a "bottom-up" undertaking, as well as be a dynamic, iterative, participatory process. Compared to the advances in urban WS&S sector there has been limited progress in top-down WRM in recent years and much remains to be done. Sustainable WRM and use involves top-down aspects, including:

- establishing policies, laws, organizations, and regulations for managing water;
- defining the availability of water and determining broad water allocations (including environmental needs) within river basins and aquifers for different sectors and political administrative entities (LGUs);
- setting water quality standards;
- cross-sectoral and inter-provincial cooperation at the river basin and/or aquifer level.

40. The bottom-up part of water resources management requires participation of water users, including farmers, towns, cities, industries, and infrastructure operators, who are the actors that ultimately determine how the resources will be used. Their views and incentives for participation, as well as their responsibilities need to be taken into account, defined and strengthened when establishing a rational WRM system. Bottom-up approaches can test and develop the establishment of new institutions, such as bulk water suppliers, and water user organizations in pilot projects. LGUs, IAs and other local entities should play a principal role in bottom-up approaches in WRM. Sustainable water resources management and use involves bottom-up aspects, including:

- educating and mobilizing water users, as well as incorporating their views into the planning and management processes;

- involving more participation at the local government level, establishing more ownership, accountability and contractual relationships and better definition of the roles and responsibilities of service provider and service receiver;

- improving water use efficiency and water conservation in conjunction with the water users;

- defining rights and obligations in terms of water rights and permissible discharges and the system for coordinating, regulating and controlling stakeholder actions; and

- implementing a complete system of water rights and discharge permits; registering, licensing, control and enforcing within strictly and locally defined criteria of water availability and quality objectives and environmental sustainability.

The bottom-up approach can possibly be realized by enhancing local capacities through "local capability building programs." NGOs and outside resource organizations, both domestic and foreign, would have very significant roles to fulfill this concern.

41. The top-down and bottom-up processes need to be dynamic, iterative and participatory. Top-down policies, regulations, standards, allocations need to be continuously reviewed and revised based on feedback from bottom-up programs. Bottom-up programs need to be adjusted and improved in accordance to top-down revisions. Different government agencies, the private sector, civil society and water users need to continuously participate in defining and implementing the top-down and bottom-up aspects of water resources management to ensure transparency, fairness and broad input. A key to establishing both "Top-down"–"Bottom-up" relations is the availability and use of accurate information and data. Experience shows that the availability of accurate and relevant information and data has been crucial in developing a com-

mon understanding of the situation and an acknowledgement of what needs to be done to respond to emerging concerns. Information is the basis for convergence and action. The Bank can help to bring international assistance and experience to bear in addressing both top-down and bottom-up aspects of WRM.

THEME 5: WATER RESOURCES MANAGEMENT NEEDS TO SUPPORT POVERTY REDUCTION.

42. Irrigation, Watershed Management, Water Supply and Sanitation, Flood control and mini-hydropower development can be instruments for addressing poverty in rural and urban areas with pockets of poverty. CDD should be a principal mechanism for implementing water related activities and achieving poverty reduction. Sustainable WRM would include—through CDD—improving the role of local communities in rehabilitating and managing watersheds. If this role conflicts with the upland livelihood activities (e.g., charcoal making), WRM should support mechanisms for creation of alternative livelihoods or for compensations. Sustainable WRM and environmental preservation can also be critical to the poor because they are often the first and most severely affected by deteriorating resources. Improvement of sanitation (including low-cost sewage disposal) is needed in low-income urban communities, and can well be addressed through CDD (see Issue 5). Gender should play a role in CDD and poverty reduction, e.g., through a wider and potent involvement of women in water-user associations and watershed management associations/councils (see Issue 1, para 48). The Bank can assist in implementing projects in poorer regions and improving project design and implementation aspects in Bank-financed projects to help address poverty reduction issues, and to ensure the poor are not negatively impacted by water resources projects.

43. The WRM implications for upland poverty require close consultation and involvement of the upland NGOs, private entities and PO (e.g., National Commission of Indigenous People NCIP). Upland inhabitants (including farmers migrating from lowlands) practice rain-fed[6] environ-

mentally-unsound subsistence farming,[7] resulting in deforestation and loss of soil fertility. The value added of a square kilometer of forestry (including flood-control function, recreation, contribution to groundwater/domestic water and other nonagricultural water uses) may far exceed that for rice production practiced in uplands. Reforestation, soil conservation and improved vegetation would increase deep percolation and reduce runoff losses, downstream flooding, and sedimentation/siltation in water ways (thus, improving water quality and providing more water to municipal and industrial users). IWRM could provide a system of transferable land-and-water rights that ensures a sustainable and efficient use of the land and water resources, as well as helps create alternative livelihood for upland inhabitants. Upland People Organizations (PO) contracted by donor projects have been active—through CDD—in creating jobs for reforestation, seedling-dissemination, soil conservation, and river-embankment flood works, as alternative livelihood for upland inhabitants. These provide a disincentive to tree harvesting and also secure resettlement options for indigenous peoples (IP). Protection of wetlands and construction of artificial lakes or small water impoundments could be complemented by watershed rehabilitation works such as plantation of bamboo along the lakes, water impoundments, and river banks; thus, providing livelihood alternatives for the poor.

Theme 6: New water resources infrastructure, rehabilitation/modernization of existing infrastructure, and adequate O&M are key requirements to achieve the objective of continued sustainable economic and social development.

44. The Bank can assist in the design and implementation of water resources infrastructure projects that are set within an adequate WRM framework. Infrastructure investments need to be carried out while at the same time attaining sustainable WRM and use. There are many infrastructure classes that continue to have high economic—not necessarily finan-

6. CISs and NISs are mostly on flat lowlands; sloping uplands are mainly rainfed.

7. Farm sizes may be smaller than 1 hectare, growing potatoes, upland rice, corn and root crops.

cial—rates of return, including: sanitation, sewerage, inter-basin transfer projects, agricultural water conservation, irrigation and drainage system rehabilitation, dams/ reservoirs, flood control works, watershed management works and industrial water pollution control facilities. The benefits from these investments can be maximized by embedding them within an improved water resources planning and management framework.

45. The Bank will place more emphasis on the concept of *"irrigation modernization,"* combining new management systems with infrastructure investment, and not simply repeating the old patterns of rehabilitation alone. Modernization is a process of managerial and technical upgrading, embedded within a set of institutional reforms. The irrigation performance benchmarking, being developed and promoted by the International Water Management Institute (IWMI), Food and Agriculture Organization (FAO) and the Bank has been tested in the Philippines. This is a tool that is particularly useful for monitoring and evaluating service changes in particular system over time. Development of a practical and operational methodology for modernization, supported by benchmarking, would enable the Bank and other donors to move beyond the simplistic approach of IMT alone, which will not resolve existing service problems and may indeed worsen the situation. The Bank will not limit its support to "institutional reform" but will also move towards upgrading irrigation service standards, modernizing technical design and managerial capacities at the national agencies, combined with (i) institutional streamlining; and (ii) empowerment of users to improve resource management efficiencies.

46. In the past the Philippines, like elsewhere in the world, has focused much more attention on infrastructure development than on O&M of existing infrastructure. Adequate institutional and financial mechanisms need to be designed and implemented to ensure sustainability of the investments. The Bank can assist the GoP ensure that appropriate institutional systems, including adequate O&M mechanisms at the local level, are built into water resources management programs to replace some of the functions presently held by central line agencies like NIA and LWUA. For instance, the IMT program mandated by AFMA is a good vehicle to carry out this endeavor, for O&M of a part of NISs.

IV. Strategic Issues Where the Bank Should Play an Important Role

Issue 1: River Basin Management (including Watershed Management).

47. In the 1990s the Bank supported the preparation of a Water Resources Master Plan (1998, NWRB) through the Water Resources Development Project (WRDP). The plan designated 17 major river basins as WRM and planning units. The Government of the Philippines has requested the Bank's support in furthering the river basin management agenda. The fundamental conditions for a river basin approach to work are found widely in the Philippines—upstream and downstream conflicts that have to be resolved in the context of a river basin, which transcends administrative boundaries. The Bank will work on particular basins with urgent problems and these projects will be the instrument for focusing strategic efforts and piloting replicable approaches. In this regard, the Bank is currently working with Philippine counterparts to prepare the FY05 River Basin and Watershed Management Project (RBWMP). This project will support integrated river basin and watershed management in selected priority river basins. The project will be carried out mainly in the Bicol Basin, a major poverty area, and would include institutional development, rural development investments, critical watershed improvement and management, irrigation systems transfer and management, and flood mitigation measures in the long term. It would also have a WRM component to begin to address river basins with more serious and complicated water resources issues, specifically the Angat/Metro-Manila/Laguna de Bay and Cebu areas. Projects specifically targeted at watershed management such as the CBRMP (Community Based Resources Management Project) and the WRDP, should in the future be more closely coordinated with the corresponding River Basin Management (RBM) activities, either by subsuming watershed management within the RBM projects as in the proposed RBWMP, or by closer coordination in project preparation and implementation. The CAS for the Philippines 2003-2005 stresses the need for

natural resource management to halt the declining resource base—land forests, watersheds, river basins and coastal habitats. The welfare of rural people and the sustainability of their livelihoods are at stake.

48. **Watershed management within RBM**—The livelihood of upland inhabitants[8] in the Philippines has been partially dependant on uncontrolled tree harvesting and rapid conversion of forests into marginal farmland. This results in upland deforestation, soil erosion and aggravates rainfall-runoff flooding of lowland areas. DENR has been implementing a Watershed Management Improvement Component (WMIC) of WRDP, building on recommendations of a DANIDA-funded study (Philippine Strategy for Improved Watershed Management). Included in WRDP is the preparations of a national watershed management strategy which should provide a sound basis for the watershed management component of RBWMP. For critical watershed areas, a CDD approach within the Bank-supported CBRMP is being applied towards developing bottom-up Watershed Management Councils (WMCs, formed by POs from elected local leaders and tribal elders, Mayors/LGUs, and academia) to ensure a sustainable watershed management at the community level, post WRDP-WMIC completion in 2004. WMCs would cost-share the loan amortization with the GoP. Protected Area Management Boards (PAMBs, formed by LGUs and Watershed Management Associations; shared by DENR regional offices) are established in some critical watershed areas where LGUs are more effective than in the case of WMCs. The Bank-assisted Conservation of Protected Areas Project (CPAP) has been applying the CDD approach with coordination between water users and environmental-management entities. The success from these Bank-assisted examples ushers a potential for devolution of natural resources management to LGUs, local communities and small institutions. In CBRMP and CPAP, communities were organized (with a legal personality as cooperatives), provided training and given stewardships of their forest areas making them attractive for investments from the private sector. The private sector participation is critical given the financial and technical skills that will be transferred to the communities. Currently, joint venture

8. Uplanders, IP, and lowland-migrant farmers.

arrangements have been are being tested and are providing additional income to the communities. Documentation of successful CDD in watershed management are to be utilized (e.g., in Nueva, Vizcaya, Mt. Matutum, Iloilo and Bukidon). Five million hectares of forest lands are currently under various CDD instruments.

49. **RBM and NWRB/DENR**—The WRM component of the Bank-supported RBWMP may include policy and institutional support for basin management at the national level, including strengthening of NWRB/DENR capacity to assume effective regulatory and planning roles. This could be achieved through establishment of inter-agency Taskforces—hosted by NWRB to formulate and initiate implementation of Strategic Action Plans for the regions having critical water bottlenecks (see Issue 2). The 1976 Water Code has been comprehensive in policy context but lacking implementation and enforcement. Developing insightful Implementing Rules and Regulations (IRR) is a challenge for NWRB, especially in regards to cross-sectoral raw water pricing and transferable rights. The said Taskforces could also provide NWRB with insights for improving these IRR. Pipeline Bank assistance to NWRB could also build upon activities supported under WRDP which include: (a) preparation of a national Water Resources Master Plan; (b) institutional strengthening of NWRB; (c) improvement of National Water Data Collection Networks; (d) establishment of a National Water Information Network; and (e) innovative cross-sectoral funding and planning/implementation mechanisms for irrigation, watershed management and environmental components. The Bank could continue to support these WRM strengthening aspects in the RBWMP and in follow-on projects, but should ensure that decentralization and CDD play a central role in these projects. The Bank could also support the use of decision support systems for water quantity and quality management (e.g., in coordination with the Philippines academia and research centers), as these are substantially lacking.

50. Different river basins in the Philippines are at different stages of development; some basins like the Bicol have sufficient water resources to permit further development, while others such as Angat and Cebu have fully, or even over-committed resources. The Bank should support

river basin planning, management and regulation that takes into account the different stages of development when defining the mix of management and investment initiatives that would be most appropriate. One important challenge is to identify the common denominator from which IWRM is locally accepted and applied. In some cases the scale of watersheds transcend local political boundaries and there are limits to the capabilities and capacities of LGUs and communities to take joint-responsibility over watershed and water resource management.

51. The RBWMP would be the first in a series of possible Bank-supported projects over a period of 20 to 30 years with the objective of eventually having all of the important water resources in the country planned, managed and regulated at the river basin level. For the Angat/Metro-Manila/Laguna de Bay and in additional basins, while continuing to provide some support to Cebu basins, the RBWMP should support strategic planning including emphasis on transferable water rights with the idea that these basins with critical water quantity and quality management issues would be included in a second project. In addition to these Manila and Cebu components, the second project would probably continue to have a lower degree of support to the Bicol Basin. Subsequent projects would bring basins supported in previous projects. As RBM is a nascent approach in the Philippines, the Philippine counterparts emphasized that RBWMP should not to be seen as merely a "new good project" but rather be prioritized on the country's rural development, environmental and natural resources management agenda, since RBWMP provides an indispensable piloting for the needed follow-on RBM interventions countrywide. However, attention to RBM clearly requires a counterpart "champion," given the myriad and diverse cross-sectoral issues embodied in RBM, and given the fragmented/insufficient coordination between the water-related line agencies.

52. There is one functioning River Basin Organization (RBO) with enforcement powers in the Philippines—the LLDA, although LLDA has yet to become a fully effective WRM organization. Partial attempts to implement RBM have been tried in other basins, but these were mainly in conjunction with project implementation and did not have institutional sustainability. The basic reason for these less-than-successful expe-

riences is that they were set up without the direct and empowered participation of LGUs, water users, private sector, local NGOs and people organizations (POs), and other bottom-up stakeholders. The Bicol River Basin Authority was abolished because of: 1) the marginal roles of LGUs and local communities, 2) some of its functions became redundant after establishing the RDC, 3) overemphasis on development of infrastructure with little concern for CDD and LGU participation, and 4) lack of sustained budgetary support and cost sharing. The Agno River Commission has recently been established, and its early evaluation also emphasizes the need for a participatory bottom-up approach. Any new river basin management mechanisms must guarantee this participation, and be consistent with IWRM, decentralization and CDD. The Government of the Philippines current policy is however not to encourage the creation of new government entities. It is therefore appropriate that the Bank—as a "pragmatic" approach towards creating a more "principled" (i.e. a self-reliant) RBO in the Philippines—supports light river basin institutional mechanisms in the form of decision making committees and small technical secretariats that would be linked with existing entities. The committees/secretariats would coordinate basin-level activities implemented by provincial and municipal governments and Barangays. These committees/secretariats should normally be harmonized with the Regional Development Council (RDC) that already have most of the necessary entities/stakeholders involved (the RDC meets monthly and has an advisory group composed of congressmen, line agencies, LGUs representatives, NGOs, and the private sector). Where more than one RDC is involved such as in the Mindanao Basin, the mechanisms would need to link activities of the different RDCs.

53. For the Bicol RBWMP, and in line with international experience with RBM and GOP's own experience with decentralization at the basin level, a Bicol River Basin Board BRBB is to be established to be substantially independent in managing the Bicol components of the project, under the oversight of the RBWMP Project Board. The BRBB would comprise its executive Board, a Technical Working Group (TWG) and a small Project Management Unit (PMO). The BRBB's Executive Board would be chaired by the Regional Executive Director, Region V, DENR, and co-chaired by the NEDA Region V Director, with mem-

bership formed from other Region V agency directors involved (NIA, DPWH, DOH, etc). An informal link would be maintained with Region V's RDC to ensure harmonized activities between those implemented by BRBB and regional initiatives. This harmonization would be facilitated as most of the BRBB Executive Board are also in the RDC. The BRBB TWG would be comprised of senior staff from the various agencies above, the Provincial Planning and Development Coordinators (PPDCs), complemented by members from the private sector, civil society, academe, socio-professional groups, indigenous peoples, and other interested stakeholders. The BRBB Management Unit (MU) would be comprised mainly of a small group of full-time staff detailed or seconded from the concerned line agencies. For the follow up projects in Bicol or in other river basins, this institutional approach should be refined based on the experience learned in RBWMP.

54. For the follow-on RBM projects, NWRB will hopefully have been integrated into DENR down to the regional level and this "regional NWRB-DENR" entity could serve as the basin's sole regulating body, or at least could chair the executive board of BRBB. Service providers would include the regional line agencies like NIA and DPWH but with a maximum involvement of decentralized entities including LGUs, water-user groups, and the regional/local private sector.

55. Over time, the desirable objective for the BRBB and its MU would be for it to be self-sustaining on its operating costs from revenues generated. One option would be as a corporation, following, for instance, the (Australian) Goulburn Murray Water agency model. An attractive feature of a corporation, and strongly desirable for the sustainability of the RBO, is that it could collect fees from users (LGUs, POs, industries, etc.), and thus be self-sustaining. In turn, as it collects fees from users, and is "owned" by and provides services to these users, incentives for impact and cost-effectiveness are inbuilt, and externalities can be internalized. However, in a developing country context, especially in poor regions such as Bicol, revenue sources in the initial years of a basin institution are unlikely to be adequate. BRBB will likely require a number of years before the necessary revenue streams can cover its operating costs. Transition to a corporation would also need to be studied. The project will

thus include an institutional study and access to cross visits, exchanges, and international study tours, with the objective of starting a transition towards a self-sustaining basin entity by the end of the project.

56. Bank RBM projects should include support for the following:

- **Environmental Sustainability**—The projects should include basin planning to determine the availability and requirements for integrated sustainable management of water resources in terms of both water quantity and quality for surface and groundwater. The requirements for environmental flows and basin outflows for sediment transport, water quality management, and coastal and marine management should be considered in these analyses. Allocations of available water and return flow quantity and quality requirements should be made for each use. Supply/Demand planning estimations should be made considering both supply and demand management options. Sustainability analyses should also address watershed management, aquaculture, coastal zone management and flood management issues.

- **Implementation of Policies**—The projects should support NWRB/DENR and other Philippine national and local government entities to implement their mandates in water resources planning, management and regulation at the river basin level, and emphasize the participation of LGUs, water user groups, the private sector and other stakeholders. This would include the setting up and strengthening of river basin committees/secretariats for water resources planning and management and development. New mechanisms need to be found to channel Bank financing more directly to LGUs, a good example in the WS&S sector being the use of state banks as intermediaries. The financing of water resources development should support decentralization and CDD objectives. Where possible, investment implementation and operation should be at the local level with LGUs playing an important role. Many LGUs see and interplay with river basins as political units not as hydrological ones. LGUs—as with RDCs—must be capacitated and strengthened to participate in integrated RBM.

Bank financial support for central institutions (including at the river basin level) such as NWRB, DENR, NIA and LWUA, should increasingly be to assist them in strengthening their responsibilities in regard to policy, performance monitoring, regulation and in the provision of technical assistance.

- **Top-Down : Bottom-Up**—The projects should support top-down aspects of river basin management. The projects need advocacy for RBM/IWRM and an institutional structure must be in place to at least promote and push the concept at the river basin level. It must have a systematic approach to IWRM. Second, the project must advocate for a national leadership/championship in IWRM as there are fractious national agencies involved in water. The latter should include strengthening of NWRB/DENR at the national and river basin level, and overall basin planning, management and regulation including the definition of broad allocations of water to different purposes in accordance with sustainability objectives. The projects should support bottom-up aspects of river basin management, with the direct participation of LGUs, IAs and other local entities responsible for WRM. CDD needs to be an important avenue for bottom-up community participation in river basin management. Bank supported projects should include the establishment of administrative mechanisms at the river basin level for the issuing, monitoring/measuring and enforcing of water rights and discharge permits. In order to make this easier to manage, water right licenses can probably be limited to bulk water users (municipalities, industries, IAs, etc), with water management within these entities being their direct responsibility. Once a system of bulk water right licenses is in place, the Bank should support the implementation of a system of transferable water rights whereby market mechanisms within the river basin can underpin reallocations. This is preferable to trying to implement reallocations through negotiations or government fiat. Discharge permits can be issued and enforced initially on large point-source polluters, and expanded as necessary to include small point-source polluters and diffuse-source pollution, as determined to be necessary for each river basin. Other aspects of water resources management includ-

ing environmental protection, watershed management, coastal zone management and flood management will also have top-down and bottom-up aspects which should be defined and assigned in accordance with appropriate responsibilities.

- **Poverty Reduction—Participation** Bank projects should support poverty reduction and community driven development (CDD) within the river basins. The Philippines has had some success with CDD which is applicable to many bottom-up aspects of water resources management and development including irrigation, rural water supply and sanitation, watershed management, and coastal zone management. The projects should include active participation of water users and others through LGUs and IAs and ensure that project benefits are channeled towards the poor.

Issue 2. Critical regions.

57. In general, critical areas that encounter serious water resources constraints are in the Manila/Angat/Laguna de Bay region, Cebu, and the Magat basin. These regions (particularly Manila) also have serious water pollution problems. The Mindinao basin also hosts one of the country's largest wetlands and one of the biggest wetlands in EAP region—the Liguasan marsh. The marsh forms a vital component of the Mindanao basin ecosystem and supports a great variety of wildlife and wetland species of grasses. Development has so far taken a toll on the wetland, which has been shrinking over the years, and some areas within the marsh are now permanently dry. Preservation of the remaining wetland and its biodiversity would be a development challenge, and the march can therefore be considered amongst the critical regions. Potential Bank-support to Liguasan marsh is contingent upon the level of peace and order in Mindanao.

58. **Manila, Angat Basin and Laguna de Bay**—Manila gets 90% of its municipal water supply from the Angat basin which also supplies water to about 30,000 ha of irrigated land in the basin. In 1998 during an El Niño drought, MWSS suffered severe water shortages. With NWRB approval, irrigators in the Angat basin were forced to cease irri-

gation for an extended period of time and all water from the principal storage reservoir was delivered to Manila. The farmers were given employment to work on irrigation system repair and other activities, but they were upset about the lack of definition of their water rights and clear transparent procedures for their transfer. Pollution is another problem particularly in the Pasig River where most of Manila's wastewater and industrial effluents are discharged, but also in Laguna de Bay, and groundwater contamination are increasingly pressing.

59. The water quantity and water quality issues in the Manila region, including the Angat, Pasig River and Laguna de Bay basins need to be studied and then planned, managed and regulated in a comprehensive integrated manner. Through the RBWMP, the Bank plans to support a strategic planning process that would be carried out with the participation of government and private entities and supported with technical assistance from international and national consultants that would:

- consult with all national and international entities involved and review existing studies and data;

- evaluate alternative comprehensive strategic plans and agree on the "best" plan for meeting Manila's future water quantity needs including procedures for compensating farmers for curtailing irrigation during droughts (temporary transferring of water rights), demand management (leak reduction, pricing/measurement), wastewater reuse, transfers from other basins and use of Laguna de Bay water;

- evaluate water quality and pollution problems and develop a comprehensive strategic plan for solving them; and

- develop and implement a parallel plan for public participation, and increased awareness to get public input and buy in to water strategy (such as the Private Participation Audits for the Manila water concessions in the WS&S sector).

Recalling the disincentive for politicians (e.g., LGU Mayors) to enforce the planned reforms in light of the 3 or 4-year short election cycle, annual action plans should be updated and implemented after the strategic plan is prepared and agreed. Parallel to the RBWMP preparation process, the Bank should seek to enlist assistance through the Bank Netherlands Water Partnership Program (BNWPP) to analyze and provide technical assistance to lay the groundwork for key aspects of this strategic planning process.

60. The Laguna De Bay lake located directly south east of Manila represents an as yet unutilized potential water-supply source for Manila and for irrigation of the areas around the lake. The western bank of the lake is open through a gated-channel to the sea, providing fisher-folks with livelihood, but contributing to salinity intrusion from the ocean. The western part of the lake is therefore saline and also polluted by the domestic waste/wastewater and industrial effluents being dumped in the western-lake confluence of estuaries.

61. The LLDA is supervised by DENR but has been financially independent because LLDA collects (right-to-discharge) fees from the firms/LGUs against their industrial/domestic effluents (they also collect revenue from permits, clearances, fish-pens and some marketable securities). The fees embody a fixed part to recover administrative costs and a BOD-load metered part. The latter does not appear to be high enough to induce significant reductions in the effluents at the industrial and collective-LGU-sewer point sources. Seventy percent of the organic pollution load in the Pasig river, Laguna, Manila, and Cebu stem from domestic wastewater. Collection and treatment/disposal of sewage requires financing, e.g., through tacking on a surcharge to consumer water bill. LLDA could excise a bulk surcharge from LGUs/Water Districts, and the latter could co-share the surcharge, but Water Districts/LGUs should first provide a satisfactory level of sanitation service to the municipal water end-users. The GoP has recently decided to consider a series of Bank supported projects that could finance infrastructure and management investments to support LLDA in improving the lake's WRM and environmental management. Another potential project would be a GEF project under OP10 (land based sources of marine pollution) that could

support improved WRM and pollution control in the Pasig and Laguna de Bay basins. These projects would need to be prepared and implemented within the context of the overall Manila, Angat Basin, Laguna de Bay strategic planning.

62. **Cebu**—Cebu is the Philippines' second largest city and is located on an island with very limited water availability. Outside the city, there is also considerable surface water use for irrigation and other purposes. Existing water supplies for Cebu are principally from groundwater sources that are overexploited. As demands increase the water resource usage is not sustainable. Through the RBWMP, the Bank plans to support a strategic planning process that would be carried out with the participation of government and private entities and supported with technical assistance from international and national consultants that would: (a) consult with all national and international entities involved and review existing studies and data; (b) evaluate alternative comprehensive strategic plans and agree on the "best" plan for meeting Cebu's future water quantity needs including transferable water rights to transfer water from irrigation to municipal users (in the dry season), inter-basin transfer (e.g., from Bohol Island), rainfall harvesting, groundwater recharge, demand management (leak reduction, pricing/measurement), wastewater reuse, other; (c) evaluate water quality and pollution problems and develop a comprehensive strategic plan for solving them; and (d) develop and implement a parallel plan for public participation and awareness to get public input and buy into water quantity and water quality strategic plans. Bank assistance through the BNWPP could be enlisted to lay the groundwork for this strategic planning process. Considering that NWRB's integration into the DENR at the regional level may be slow paced, establishment of a Cebu Water Council (formed by the Cebu NGOs, private sector, and concerned line agencies) is envisaged to assume the role of WRM for Cebu.

Issue 3. Surface storage, water transfer and other options.

63. The conventional approach to water resources management and development is to estimate future demands based on population growth

projections and existing trends in per capita use, and then to come up with infrastructure projects that will provide sufficient water to meet these future demands. More attention needs to be given to demand management by price and non-price means. Such measures may be the most cost-effective way of bringing supply and demand into balance. For many basins, the supply-oriented infrastructure plans include storage reservoirs to capture flows during high flow periods when they are in excess and release extra flows during low-flow periods, and if insufficient water resources are available even considering the high flow periods, include the transfer of water from other basins. Other supply-oriented options include sourcing and storage of surface or flood waters through protection of wetlands and construction of artificial lakes or small impounding dams (see para 68). Supply-side options are often feasible and necessary, and should be considered along with other options to meet long-term water quantity needs, including demand management. The Bank should support projects and comprehensive planning studies that consider conjunctive use of surface and groundwater, transferable water rights, reuse, and conventional & non-conventional supply augmentation/management options, but, always within the context of demand management as an instrument for bringing supply and demand into balance, and an instrument for getting the users to directly co-share the cost of the supply-oriented options. The Bank should also support improvements in dam safety in the Philippines. Not only is dam safety justified by itself, but it also opens a window of opportunity to better reservoir operations which is key for water resources management. In addition, it may be valuable to arrange "reservoir operations training workshops" (similar to those organized within the Bank's program in Vietnam) to gain client interest in this topic.

64. **Conjunctive use of surface and groundwater**—The conjunctive use of surface and groundwater is often a viable alternative to surface water reservoirs. Under this approach, groundwater is used to supplement the surface water during low-flow periods. This type of conjunctive use has been shown to be a highly efficient and cost effective water management approach when adequate groundwater resources are available, because costly dams and conveyance facilities are not needed and reservoir evaporation losses are avoided. Adequate groundwater

is often available in irrigated areas because the canal leakage and on-farm losses are big contributors to groundwater recharge resulting in ample quantities of groundwater. Sourcing and development of shallow and deep groundwater wells should be limited to the sustainable yield of the aquifer, as regulated by the permits issued by NWRB and enforced by LGUs/Water Districts.

65. **Transferable Water Rights**—When El Nino struck in 1997/98 the drought led to the unplanned reallocation of water from the Angat Reservoir away from irrigators, to meet the water supply requirements for Metro Manila. Since then transferable water rights have become a public issue as water *"was re-allocated in favor of Metro Manila's domestic water needs, to the detriment of irrigation water for the farmers. Although Metro Manila needed water, losses to farmers and the National Irrigation Administration (NIA) were never accounted for and compensated."*[9] Transferable water rights or water markets are a good way for scarce water resources to be reallocated by the market from lower-value to higher-value uses. However, a comprehensive market for water rights will only work where there is a good existing water rights administration system with adequate water measurement/monitoring and enforcement. In addition allocated water rights must not exceed availability. Without a well managed water rights system, water users may sell water that they are not using or they may continue to use water after they have already sold it. In the case of Angat, the most appropriate approach would probably be the complete cessation of irrigation during drought periods with adequate compensation to the farmers (temporary transfers or leased water rights). The compensation process should be transparent and agreed to by the farmers prior to its implementation during droughts. In the case of Cebu, transferring water from irrigators to municipal users would probably require that presently irrigated lands no longer be irrigated. The farmers would need to be adequately compensated and then revert to rainfed agriculture or other economic pursuits. Inter-basin transfers are likely very costly and only favored for big river basins and high-value demands.

9. NEDA

66. **Demand Management**—In large municipal water supply systems, water losses due to leakage are often very large, although these leakages often return to water bodies particularly groundwater aquifers that are also a water source for the municipalities. In the case of Manila leakage losses amount to about 56% of the water entering the distribution system. Combining increased tariffs with a good system of individual-user measurement and an effective billing system can significantly reduce water demand in municipal water systems. Graduated tariffs that start out low and increase significantly for higher usage have been used in water districts, but have often had the perverse effect of forcing large users to switch to self-provisioning (as groundwater usage is not monitored.) For the non-agricultural uses, LGU executive departments (or local chief executives of the prospected RBM boards) should bear responsibility for enforcing the price and non-price demand management means, together with control of illegal connections and enforcement of groundwater permits issued by NWRB/basin's regulatory board. Demand management in irrigated agriculture can also be effective through pricing/measurement and efficiency improvements. However, it is important to keep in mind that efficiency improvements do not save water from the hydrologic system to the extent that they reduce losses that are returning to water bodies (aquifers and rivers) that are used by others. Real water savings in irrigated agriculture come from the reduction in non-beneficial evapotranspiration (ET) and in reduction of crop consumptive use (ET) by adjusting cropping pattern, introducing water-saving varieties, and modifying agronomic and on-farm irrigation practices. Promoting crop diversification and water-saving hybrid rice varieties would require both farm-input and post-harvest support (including improved rural credit, paddy drying, and farm-to-market roads).

67. **Reuse**—The reuse of wastewater can be an effective way of reducing demand. Within industrial complexes water can often be treated and recycled to the extent that bulk water requirements are significantly reduced. For municipalities, treated effluent from wastewater treatment plants can be used for green area irrigation or industrial supply and thereby significantly reduce bulk water requirements.

68. **Rainfall Harvesting**—The Bank has generally downsized its support for the costly development of new irrigation areas worldwide, especially using conventional infrastructure and large-scale surface storage. However, the GoP has been successfully piloting Small Water Impoundment Projects[10] (SWIMP) to harvest rainfall in the wet season, that would otherwise be lost in run-off to the sea. The LGUs determine whether a SWIMP will be needed in each local area; SWIMPs are thereafter used in the dry season. A priori is to supplement irrigation (of dry-rice and vegetables); next is to safeguard water for some domestic uses (e.g. washing) and livestock consumption; and to provide water for inland fisheries, agro-tourism and recreation (tourists exhibit good willingness-to-pay to the farmers) all providing additional livelihood for farmers managing the SWIMPs. Part of the generated income feeds IA-collected common funds for farmers. Given the often poor quality of the water harvested, usage is generally restricted to agricultural and non-potable domestic uses. There are many local requests that SWIMP-use be augmented to supplement (groundwater) potable water supply, but this would require costly filtering, given the small economy of scale. Another drawback of SWIMP is that evaporation losses can be high, as influenced by the dry-season temperature and wind speed. GoP generally supports a wider-scale rainfall harvesting as, according to an Australian TA study, that could defer the construction of many dams by 20 years. But, a cross-cutting economic analysis of such endeavors is needed. The Bank-supported Agrarian Reform Community Development Project (ARCDP, mainly hosted by the Department of Agrarian Reform DAR) has a successful SWIMP component implemented by the Bureau of Soil and Water Management (BSWM, of DA). Also, the LGU component of the Bicol RBWMP will support a menu of bottom-up endeavors including similar small-scale irrigation, privately owned and operated by LGUs and local communities.

10. Small earth-compact surface reservoirs, which dry up after full use. The first SWIMP was an initiative by one municipal Mayor, after which most of the municipality's inhabitants acquired livelihood in irrigation.

Issue 4. Irrigated agriculture.

69. The total service area of the irrigation schemes in the Philippines is about 1.5 million ha, but the actual irrigated area is estimated to be less than 1 million ha. Public irrigation in the Philippines has been the responsibility of NIA which has constructed and managed a service area of about 690,000 hectares in the National Irrigation Systems (NISs), which is about 50% of the total service area in the country. In addition, there are about 680,000 hectares of Communal Irrigation Systems (CISs), which are owned and managed by the IAs. There are also about 10% of irrigated areas that are managed by the private sector. Until the promulgation of the 1992 Local Government Code, NIA was the financial conduit and had the responsibility for construction, rehabilitation and institutional development on CISs. NIA owns and operates, on behalf of the state, the water rights and the assets of the NISs (except for the tertiary canals). The NISs are in some cases large ones involving more than one province, which has been determined by GoP as a reason for continued involvement of NIA in the NIS. This is in contrast to WS&S systems that are always within one LGU and therefore more easily turned over to LGUs for implementation and O&M. As for CISs, the ownership and O&M continue to be with the IAs, but the responsibility for construction and rehabilitation was devolved from NIA to the LGUs by the Local Government Code (see paragraphs 77 to 80). Given that 50% of the irrigation sector in the Philippines is owned and managed by either the IAs (CIS) or the private sector (mainly pumping schemes), and that the rest 50% (NIS) is under various levels of participatory irrigation management, there is a good deal of farmer participation in the Philippines, in comparison to other countries in the developing world. This has been one under-emphasized fact of the Philippine irrigation sector. It is important to distinguish the distinct differences between NIS and CIS in terms of ownership, management arrangements and financing mechanisms. The following paragraphs thus present issues and strategic recommendations with regard to NIS and to CIS respectively.

70. **NIS.** The service area of the NIS is now 690,000 ha, but the actual irrigated area in both the wet and dry seasons is less than 500,000 ha. There is, therefore, a huge gap of about 200,000 ha. This gap has result-

ed from a variety of factors: water availability, flooding and droughts (including increasing El Nino impact in the 1990s), and inadequate O&M. The Bank strategy for the irrigation sector, which had focused on financing new construction in the 1970s and early 1980s, shifted in the mid-1980s to financing of improvement and modernization of the existing NIS, while continuing to support new construction and rehabilitation of the CIS. Since the mid-1980s, the Bank has not financed any new NIS construction. This shift in strategy was designed to achieve several objectives: (i) closing the gap between the service area and the actual irrigated area, so that irrigated area could be expanded at a much lower cost due to sunk costs, and thus the problem of low economic rates of return in irrigation projects (which were the result of a serious decline in world rice prices in the 1980s) could be avoided; (ii) by focusing on existing NIS, the Bank could have a much bigger leverage with NIA for institutional reform at both the NIA and water users' levels; and (iii) the serious problems of resettlement, which had been experienced earlier in the construction of new dams, could be minimized. This strategy has worked reasonably well, in the sense that considerable expansion of the irrigated area has been achieved under the Bank-supported IOSP II and the on-going WRDP at a relatively low cost, and replicable models for technical modernization, irrigation management transfer (IMT), pilot volumetric irrigation pricing, and cost recovery policies, have been developed. This strategy is recommended to continue over the medium term, since the Bank has the credibility with NIA and other government lead agencies to pursue institutional reforms more aggressively, and an important opportunity now exists to apply the lessons learned under the Bank-supported projects, and deepen the irrigation sector reform process over the medium term.

71. **Participatory Irrigation Management (PIM) in NIS.** Although NIA is legally responsible for the O&M of NIS, it has experimented with various forms of PIM over the last three decades, primarily to reduce its operating costs and to increase the irrigation service fee (ISF) collection. In the 1970s, NIA became a pioneer in the developing world when it piloted PIM in the Bicol Region. Since then, the PIM program has undergone several phases. At first, the "Stages" system was introduced. Under that system, the IAs were to progress from Stage I,

which was only a maintenance contract for secondary (and sometimes main) canals, to Stage II, which was a contract for maintenance as well as operation and ISF collection. Under Stage II, therefore, the IAs were free to allocate their share of ISF to maintenance and other activities in any amount they wished. Stage III, which was to be a complete transfer of O&M to the IAs, was, in practice, applied only to small pump schemes, where the IAs amortized the cost of pumps. During preparation of IOSP-I in the early 1980s, the Bank had reservations about the quality of maintenance done by the IAs in the Stage II contracts. The Bank and NIA, therefore, introduced a new "Type" system of contracts under IOSP-I. Type I and III contracts were the same as Stage I and Stage III contracts (except for ISF sharing formulae). Type II was a contract only for operation and ISF collection (not maintenance). Thus, instead of progressing from Type I to Type II, the IA had to have separate Type I and II contracts. This separation was done to ensure that maintenance was done properly and was monitored. Although the objective of the Bank and NIA in introducing the "Type" system, that is, to ensure proper maintenance of the NIS, was valid, the system could work only if NIA allocated enough funds to award Type I contracts (for maintenance). In reality, this is not always the case. In hindsight, it is clear that neither the Stages nor the Type system can work efficiently if NIA's operating costs including its high overhead are dependent upon ISF collection. While the Type system was directly dependent on NIA' finances, the Stage II contract, which was based on a breakeven system of ISF sharing (that is, NIA's staff and other operating costs were fully protected before the IAs received their share of ISF) left little for the IAs with which to maintain the canals. In December 1998, a new type of contract called "IMT" was introduced under the Bank-supported IOSP-II. While this contract is similar to Stage II contract, it takes into account the lessons learned from the previous systems. Instead of the breakeven system under Stage II, the IMT contract is based on a flat sharing of ISF between NIA and the IAs, usually 50%. The share of the IAs has thus been raised from the earlier 5-15% under the Stages and Type systems to about 50% on the average under the IMT system. This has significantly improved the financial situation of the IAs that participated in the IMT, and their capacity to undertake proper O&M and other activities. At the same time, the flat sharing system has reduced NIA income and created

a NIA financing and staff redundancy problem, which has the virtue of increasing pressures on NIA to pursue streamlining and thereby reduce its operating costs. Unlike the earlier systems, the IMT contract is awarded after system improvement and modernization have been completed in full consultation with and collaboration of the IAs, including their equity contribution in the form of labor, so that the IAs have less difficulty in operating and maintaining the canals after signing of the contract. Although the IMT system incorporates several improvements over the earlier systems, documentary evidence is lacking whether the IAs are undertaking O&M as required under the contract. This is one of the principal issues to be addressed under the proposed IMT AAA (see para. 81). The extent of capital build-up by the IAs so that they can undertake routine maintenance from their own resources is another issue to be addressed by the IMT AAA.

72. The 1997 Agriculture and Fisheries Modernization Act (AFMA) provided a legal cover for PIM for the first time. Under AFMA, NIA is mandated to transfer the O&M of secondary canals to the IAs, while remaining responsible for O&M of headworks and main canals. But it should be noted that, until recently, PIM efforts in the Philippines were almost entirely a NIA-Bank collaborative venture. In the past few years, other donors have joined in the IMT effort in designing their irrigation projects. It should also be noted that under the IOSP II and WRDP, NIA had agreed with the Bank to a complete transfer of O&M of smaller systems (below 3,000 ha). This is not required under AFMA. NIA, therefore, is not mandated to continue with such type of transfer after the WRDP loan closes. However, the Bank and other donors should persuade NIA to continue with such transfers, as they are in the long-term interests of effective O&M of the NIS and farmer empowerment.

73. **What the Bank can do to help NIS?** The Bank should continue to support NIA in closing the gap between the service area and the actual irrigated area. In this process, the IMT for secondary canals should play the key role. The systems/canals to be transferred should be rehabilitated, improved and modernized in consultation with water users so that the systems/canals are in good working order and the users agree with and sign off on any remedial work. Water user participation in

design and construction supervision should be encouraged even to the extent of the IAs being parties to contracts, where feasible. The decentralized implementation process adopted under IOSP II and WRDP is a step in the right direction. It will be important to further decouple NIA streamlining from IMT. The ISF should only cover the costs of irrigation services including bulk water deliveries and not be directed towards meeting NIA's high overhead costs. The ISF share of IAs in the IMT contract could increase, so that the IAs become more autonomous and acquire the financial capacity to undertake routine repair and even improvement in due course. It is recognized, however, the GOP would need to continue to provide emergency/disaster assistance to the IAs. For the transferred part of the systems, NIA's role would change to one of ensuring national standards for irrigation scheme modernization, monitoring the performance and service standards of schemes (holistic benchmarking), and technical assistance and training. Volumetric measurement and pricing at the point of delivery to the IAs, to cover the upstream costs of bulk water delivery, is the key element in the reform that should be strongly supported. Experience has shown in other parts of the world and in the Philippines that well-managed water delivery and volumetric pricing at the point of delivery to water user associations strongly supports the turnover agenda and water conservation. This is because the water users would have an incentive to collectively manage and maintain their systems to ensure equitable water delivery and to save water, and the bulk water deliverers would have the incentive to minimize upstream losses because they only receive payment for water that makes it to the measurement device at the point of delivery to the IAs. However, volumetric pricing is still at the pilot stage under WRDP, and it is still early to determine whether this pilot could be replicated across the country.

74. The Bank started to assist GoP in reforming the irrigation sector in pilot areas through the completed IOSP-II and the on-going WRDP. The WRDP agenda includes decentralization, financial autonomy of IAs through IMT, and watershed management. The Magat system has been testing innovations that may be widely applicable and reduce the complexities of irrigation management, while reducing the inequities that occur when top-enders take more than their share of water. Manage-

ment can be greatly simplified by modernizing flow structures, replacing gates with low-labor proportional flow dividers and long crested weirs, some of which have been successfully applied within the Bank-supported IOSP-II and WRDP. This makes the job easier for IA members and limits water security issues to main system availability, not how it is shared out which would not require active intervention. Future Bank assistance in irrigation should incorporate successful technical aspects from previous projects.

75. **Issues relating to NIA.** Since its inception, NIA has operated as a *construction/O&M agency* for the NIS, as well as a construction and institutional development agency for the CIS. Although the Bank has not financed any new NIS since the mid-1980s, other donors have. Since the irrigated area is still about 50% of the estimated irrigable area, it is premature to talk about transition of NIA from a construction agency to a management agency. The long-term goal should be for the transformation of NIA from a construction to a management role. In the mean time, to the extent that the construction role is performed by contractual staff who can be terminated after completion of construction, the transformation should not be difficult. The real issue of NIA is that the ISF and other income sources have been inadequate to meet its staffing and operating costs. NIA has used the ISF to cover its high overhead to the detriment of adequate O&M. Even routine rehabilitation has depended on funding from the government and/or donors. The operating costs of NIA need to be reduced. IMT has and will continue to result in NIA staff redundancy. NIA streamlining a pressing issue in the public sector, and thus should be addressed separately from IMT. The streamlining need would be even higher when indirect subsidies to NIA, such as the CIS amortization are removed (para. 79). Another issue relating to NIA is the need for upgrading technical skills of its staff.

76. Ideally, the role that NIA performs currently should be performed either by private sector or a basin-wide agency or water users' associations. However, there is no evidence that the private sector in the Philippines has any interest in owning and/or managing large-scale gravity irrigation systems for rice production—as is the case with NIS. There is no functioning basin-wide agency in the Philippines that could present-

ly take on this role, and it will take time to develop such agencies. Water users' associations or IAs in the Philippines have not yet developed to the extent that they can manage larger NIS. In the medium term, therefore, the government and donors should continue to support NIA in constructing, rehabilitating and managing headworks and main canals of relatively large NIS, and at the same time, pursue IMT for secondary canals in large NIS and complete O&M transfer in smaller NIS. GoP has an existing policy of public sector downsizing, and NIA falls within its scope. NIA has recently proposed a downsizing plan based on a JICA study that would support two main functions for NIA– first, construction, rehabilitation and O&M of headworks and main canals, and second, providing technical and managerial assistance to IAs. Because of labor laws and political pressures, the downsizing costs are large and, therefore, little progress has been made. NIA streamlining should be accorded a high priority.

77. **CIS.** Since its inception in the late1970s, CISs (which now accounts for roughly 40% of the irrigated area in the country) have been based on the concept of ownership and O&M of the systems by IAs. The IA borrows from the central government for new construction or rehabilitation, and after repayment of the loan, acquires ownership of the asset. The repayment of the full chargeable cost can be done over a 50-year period, or immediately after completion of construction or rehabilitation. In the latter case, the IA repays only 30% of the chargeable cost and acquires the ownership of the system immediately. Before the promulgation of the Local Government code (LGC) of 1991, NIA was the financial conduit for the central government loans to the IAs on CIS, and was also responsible for construction, rehabilitation of CIS, and organization and registration of the IAs with the Securities and Exchange Commission. In reality, all the construction and rehabilitation activities were carried out by the IAs themselves, but under the supervision of NIA. The LGC of 1991 devolved the financial channel for CIS from NIA to the LGUs. Thus, since 1991, the LGUs have been the financial conduit for the CIS in terms of construction and rehabilitation, although the ownership and O&M of the CIS still rests with the IAs as before, which borrow and repay loans. Therefore, Bank-supported projects, such as the Agrarian Reform Community Development Project

(ARCDP), Mindanao Rural development Project (MRDP), and projects supported by other donors since 1991 have channeled funds for CIS through the LGUs.

78. **Issues Relating to CIS.** Apart from the general problems in the irrigation sector—weaknesses in IA management, inadequate O&M, insufficient water-availability, etc.—the CISs have faced a particular problem since the promulgation of the LGC in 1991. In the first few years since 1991, the central government refused to finance the CIS, arguing that it had been devolved to the LGUs. The LGUs argued that they had no funds and technical capacity to undertake the CIS development or improvement. The NIA staff involved with the CIS program before 1991 were expected to be devolved to the LGUs in order to build up the latter's technical capacity. But the LGUs have refused to absorb the NIA staff, arguing that these staff were much too expensive. As a result, the CIS program suffered a setback in the early years after the LGC was enacted, as virtually no financing was available for the CIS. NIA also suffered, as it had to carry a large number of staff involved with the CIS, who had virtually nothing to do. The situation was partly remedied later when the Bank and other donors financed the CIS in several rural development projects, and the central government agreed to channel these funds to the LGUs under a grant-equity mechanism. However, it continues to be an ad-hoc arrangement—funding continues to be limited, LGUs continue the lack of technical capacity to handle the CIS without donor support. LGUs have contracted NIA to undertake the construction and rehabilitation works and to organize the IAs. NIA, however, cannot decide its appropriate staffing for the CIS at the provincial level because of the uncertain financing issue relating to CIS, and suffers due to excess in staff.

79. Another key issue related to CIS is loan repayment by IAs. Under a Presidential decree, these loan repayments are supposed to be remitted to a communal irrigation development fund. In reality, this fund does not exist and repayments (CIS amortization) go to NIA and still form a source of NIA's income. Under Bank intervention, this issue was referred to the Office of the President (OP). But no decision has yet been taken. This is a critical issue, the resolution of which would provide

the CIS with a sustainable long-term funding source. However, since NIA's income would be adversely affected, the issue must be addressed as part of a reform package including NIA streamlining to reduce its operating costs.

80. **What the Bank can do to help CIS?** The Bank should support new construction as well as rehabilitation of CIS to (a) find effective ways to improve the management capacity of the IAs and the oversight capability of the LGUs; (b) help replace the current ad-hoc system of CIS development and IA organization with an agreed framework, in which the roles of central agencies, LGUs, IAs, NIA, NGOs and the private sector are clear; and (c) help establish a sustainable financing system by establishing the CIS amortization payments as a communal irrigation development fund. The proposed Participatory Irrigation Development Project (PIDP) described below could provide the forum for such a Bank support. The Bank should also work closely with other active donors towards a coordinated approach.

81. **Sector work and project vehicles.** The Bank and the GOP intend to undertake an IMT policy work to study past lessons and to provide policy directions for building up the pipeline-investment instruments needed to carry out the IMT and irrigation modernization that started under IOSP-II and WRDP. To carry the irrigation sector reform program forward, PIDP was proposed by GoP in 2000, for which the Bank reviewed a concept note submitted by NIA including proposals for:

- modernizing irrigation systems through physical improvements but accompanied by development of managerial and technical capacities;
- intensifying the IMT across the country, accompanied by the above system improvement;
- capacity building for IAs and LGUs;
- continued piloting of volumetric pricing at delivery points;

- initiation of trials on surface/groundwater conjunctive use;
- support for CIS —both physical improvement and LGU/IA capacity building; and
- NIA streamlining and deepening of institutional reform.

82. The above IMT policy work would lay the foundation for the design and preparation of the PIDP. The proposed Public Sector Reform loan could also bring irrigation within the country's overall public sector reform, by, partially financing the NIA streamlining/re-focusing/ retiree package. Another option is to consider a Structural Adjustment Loan, following a successful experience of the Water Sector Adjustment Loan (WATSAL) in Indonesia, where Bank support is contingent upon achieving predefined benchmarks for water-sector legislation and institutional reform. WATSAL featured a great deal of harmony between the EAP water-related sector units, e.g., EASRD and EASUR; and has so far been achieving remarkable coordination level between the counterpart water-related agencies as well as other donors.

Issue 5. Water supply and sanitation.

83. In the early 1990s the poor performance of water utilities triggered a wide-ranging reform of the Philippines WS&S sector. Progress was rapid compared to a slower pace in water resources management and irrigation reform. A Bank-funded Water and Sanitation Sector Review in 1993-94 created the basis for the reform of the water supply sector, a national policy, and a strategy and action plan for urban sewerage. More recently the ADB conducted a WS&S Sector Plan Study. WS&S services have been devolved to the local level, with autonomous water districts and LGU-managed utilities responsible for delivery of services.

84. NEDA articulated the WS&S policy and strategy and gained presidential support (the 1994 Water Summit in Manila.) A 1995 National Water Crisis Act was passed giving government special powers to reorganize sectoral agencies, induce greater private participation and improve the overall institutional environment. The reforms were sup-

ported by Bank Group assistance that has helped to define the policies and reform agenda. The Bank helped GoP develop a framework for Private Sector Participation (PSP) and an overall policy and financing framework aimed at:

- Rationalizing the water sector;
- Promoting private participation;
- Improving water and sanitation service delivery to low-income urban communities.

85. The most significant accomplishment was the privatization of the Metropolitan Water and Sewerage System (MWSS) in 1997 through the award of two concession contracts to Maynilad Water Services Inc. (MWSI) and Manila Water Company (MWCI) for the western and eastern halves of Metro Manila. The assets were leased to two international/national consortia of private operators who committed to a US$7 billion upgrading over 30 years, while also assuming the foreign exchange risk. The International Finance Corporation (IFC) played a key role in the negotiations with both advisory services and investment participation. IFC is currently looking at a project to finance the Manila Water Company's capital investment program. During the 1998 Asian financial crisis, the Philippine peso was devalued by about half. This had a major effect on the viability of the Manila water supply concessions, particularly for the MWSI concession, as the firm had contracted to assume the bulk of past loan amortization. This has resulted in the failure of the concessionaires to meet their targets, although overall coverage expansions have been significant in both areas.

86. Implementation of policy reforms to rationalize the sector in the context of devolution has been slow mainly because of the varied level of preparedness within more than 1500 LGUs to assume the primary responsibility particularly with respect to financing. With support from a PHRD grant, a LWUA reorganization study (namely *Water Sector Financing Policy and Graduation Policy for Water Districts*) has been completed in May 2003 and presented to NEDA. Accordingly, an oversight commit-

tee headed by DOF has been created to formulate an action plan based on the study results, including the changes needed in sector financing policy.

87. The Bank has been in the vanguard of introducing demand-driven financing to support commercialization and privatization, but has emphasized quality and not coverage targets. The upcoming Third National Water Conference will address some key issues for progress - increasing private participation and improving water resources management, increasing tariffs and introducing demand-based water transfers, and raw water pricing. These measures complement the strategy of decentralized financing of WS&S investments through private equity and on lending of donor debt capital through financial intermediaries. Institutional capacity building has involved requiring that borrowers (utilities or LGUs) follow commercial protocols for initiating and developing projects. Attracting private investors requires demonstrating sustained and positive cash flow from operations as the basis for loan repayment (this is known as non-recourse financing as opposed to using collateral to secure the loan.) The underlying collateral for lending for social objectives, when there are no targeted central government grants, will be the general revenues of the LGUs. It is the increased IRA (Internal Revenue Allotment) as a result of the Local Government Code that has given the LGUs the financial capacity to plan and implement investment programs. The use of intercepts of non-targeted block grants are a further means of enhancing debt instruments.

88. GoP is in a tight fiscal position and sees PSP as critical for both increasing operation efficiency and asset management, as well as being a source of investment funds for future capacity expansion. To improve WS&S in poor urban and peri-urban areas, the Bank's approach requires all decisions on service levels and tariffs be subjected to consultation with communities before LGUs sign-off on loans. In order to keep a commercial focus on the operations, government financing institutions (Development Bank of Philippines and Land Bank of Philippines) are being used as conduits for the funds. The Bank's approach is to concentrate support on those LGUs that are willing to invest some of their own financial resources up front in the form of feasibility studies.

89. The Country Assistance Strategy (CAS) for the Philippines 2003-5 identifies WS&S strategic objectives both under

"Macroeconomic Stability and Economic Growth"

- Assist water utilities to improve operational efficiency and accountability to consumers;
- Consolidate the gains in private sector participation in operations of LGU water services;
- Further private sector participation by attracting private financing;
- Assist LWUA.

"Good and Effective Governance "

- Reduction in proportion of LGU investments funded from grants;
- Increase in proportion of LGU investments financed from private sector loans;
- Increase in number of LGUs borrowing from development and private banks.

90. The CAS identifies three WS&S required reforms –

- a shift of emphasis from BOT to the privatization of existing assets in order to address the fundamental problems with most water systems (inadequate investments; inefficient operations, billings and collections);

- transparent and solicited bidding of water assets;

- reassessment of the role of LWUA and other agencies.

91. The Bank's long-term strategy should be to support a separation of the regulatory and policy functions from the operational functions of government agencies (e.g., LWUA, NWRB, MWSS, SBMA.) The most pressing WRM issues for the WS&S sector are the difficulties experienced by LGUs in negotiating water source rights outside of their administrative boundary, and regulation of pollution. Transferring water rights between neighboring municipalities has been difficult. Transfers have been perceived as exchanges of political favors rather that market exchange. The

use of transferable water rights to address allocation issues requires extensive piloting. Tariff levels that will lead to commercial viability of the water utility are essential for processing water supply subprojects.

92. The Bank should provide assistance for supporting the application of nationwide effluent fees and public awareness campaigns to combat water pollution from industrial/commercial firms. In the Philippines, the EMS-certified firms (as per Environmental Management System, ISO 14001) amount to only 126 out of some 10,000 firms nationwide, indicating that EMS provides inadequate incentive for pollution control. By 2004, the Environmental Management Bureau (EMB) of DENR will adopt a new system for nationwide industrial-polluter fees. In addition in 2003 the Bank is supporting the preparation of an Environment Monitor for water quality in the Philippines (see Box 3). The Bank should continue to provide assistance to improve overall discharge control and water quality management in the Philippines.

93. Bank instruments are both AAA and innovative projects, combining technical capacity building, project management and new financing mechanisms under improved corporate governance. In the past investments have been based on centrally conceived programs and generic designs, rather than consumer demand and willingness to pay. There has been a steady eroding of the capacity of existing sectoral institutions (WDs and LWUA) under existing financing polices, while the reverse is taking place at both LGU levels (provinces and municipalities). The Bank's thrust is in supporting LGU capacity to utilize their own resources and IRA transfers to securitize financing from the banking and financial sector.

94. Bank strategy is embedded in the three active and follow-on pipeline projects:

- *The Manila Second Sewerage Project (1996-2003):* has helped MWSS in rehabilitation of sewage treatment plants, and sanitation collection and disposal. In Manila rehabilitated sewerage plants are effectively maintained by the concessionaires. A third Manila Third

Box 3. Bank-Philippines Environmental Monitor: Water Quality as Theme of year 2003

The Philippines Environmental Monitor series—initiated in 2000—presents a snapshot of key environmental trends in the country. Its purpose is to engage and inform stakeholders of key environmental changes as they occur, in an easy-to-understand format. The series is designed to track changes in general environmental trends every 5 years while in the intervening years it would highlight critical themes, of which the year 2003 is designated for water quality.

Investments in wastewater treatment have not been concurrent with economic and population growth in the country. Water quality deteriorated in rivers, lakes, groundwater and coastal areas. This endangers public health associated with (potable) water-born disease/toxins especially in major urban areas; affects aquaculture production; reduces the effectiveness of coastal areas for tourism; and results in an aesthetic nuisance of poor water quality in rivers and bays. Recent efforts have been made by GoP to address these problems, including development of the Clean Water Act for which the Bank is providing TA, together with 3 WS&S Bank-supported projects (WDDP, Manila Sewerage 2, and LGU UWSP; *detailed below*) that address part of the problem. Another water-related environmental concern is groundwater pollution and drawn-down, requiring: (a) integrated management of water supply and sanitation; and (b) stronger control of pollution and regulation of groundwater withdrawals.

The monitor will include analysis of drainage and onsite-sanitation, water quantity and aquifer draw-down/recharging, wastewater policy and related institutional reforms, financing for water quality and tariffs, government budgets, role of LGUs, Clean Water Act, watershed management, soil erosion, fisheries and other ecological aspects, characterization of different water sources, and established methodologies for analysis. The monitor will quantify the physical impacts followed by costing of these impacts. Cost-benefit analysis of improving potable-water quality will be performed.

The monitor will rely on lessons learned from related projects/programs in addressing WS&S, RBM and watershed management. Related tariffs will be addressed in the overall framework of institutional/organization setup. The most important issues will be addressed first as the monitor needs to be simple and doable given the timeframe and budget.

Survey data (perception, cost and quality) will be obtained from the Bank projects and other programs (like the ADB-supported Pasig River Environmental Management and Rehabilitation Sector Development program) towards establishing two water-quality data banks, one in Manila and one at Bank headquarters in Washington D.C. Dissemination Plan for the monitor will include wide range of target audiences through media workshop, newspaper articles, public service announcements, CD, and video documentary. Trust funds and other donors are to assist in the finance of the preparation of the monitor.

Sewerage Project is currently being prepared by the concessionaire for Manila East (MWCI).

- *LGU Urban Water Supply and Sanitation Program (1997-2010):* is a series of adaptable program loans (APLs) implemented through the Development Bank of the Philippines (DBP). In this project, DBP onlends to LGUs for water supply and sanitation infrastructure. The project preparation involves community consultations on service levels and tariffs, and the encouragement of private sector participation through lease contracts. The loan is structured into 4 successive APLs which are triggered by achievement of interim goals regarding project design and the sustainability, viability and robustness of the design. APLs 1 and 2 develop and test basic rules and administrative processes. The success of the APL loans is hoped to attract sufficient numbers of private sector operators to operate and maintain the water utilities more efficiently, and be responsive to consumer demand. Experience is that LGU mayors/councils prefer handing over the water supply system to private utilities since this would bring about socio-political resilience in raising tariffs (some LGUs have taken 2-3 years for approval of rate increase). The project aims to assist both private and LGU managed water utilities. The long term development objective is that by 2010 a quarter of LGU-managed utilities are able to supply water and sanitation services on the basis of consumer demand.

- *The Water District Development Project WDDP (2001-2006):* where the Bank helped the Water Districts promote sewerage and drainage in secondary cities (besides a successful water-supply component on public awareness). A demand driven approach has been introduced where the Bank lends to the Land Bank of the Philippines, another state development bank and retail lender, which in turn finances the municipalities for sewerage and drainage. Good O&M cost recovery from end users through add-ons to water bills has been achieved. A follow up of the WDDP would be the promotion of seed financing for urban water supply systems—e.g. through small-scale City Development Strategy Loans—that could gradually grow on demand.

95. Both the Rural and Urban EAP Sector Management Units should coordinate with the GoP to ensure that:

- National water agencies like LWUA are more responsive to the WRM implications of the GoP decentralization policy and provide support rather than act only as project champions. The Bank should continue its dialogue on corporate restructuring of LWUA.

- Paying for the water services and compensation to parties affected by scarcity-triggered water reallocations will be legitimized and fostered.

Issue 6. Flood control and management.

96. In the Philippines land denudation and soil erosion in the uplands contribute to already rapid run-off due to steep relief, and contribute significantly to floods. This has resulted both in widespread poverty in upper watersheds and adverse impacts on downstream investments (e.g., from sedimentation, siltation, and accumulation of debris and hyacinth in water ways). Land and forest management of the upper watersheds is obviously needed but many of the benefits accrue to populations in the agricultural flood plains. Physical or structural flood protection/control, requiring the building of dams/dikes/polders and flood drains, is very capital intensive and often not justified on economic grounds. The social/resettlement costs may also be considerable as shown by experience from the ADB Flood Control Infrastructure Development Project, in the Bicol Basin. As for JICA's experience, deteriorated or poorly-designed polders often hasten rainwater accumulation and augment flood impact within the poldered area. The Bank's experience is that Diking can also result in unforeseen negative spillovers e.g. on the inhabitants of the non-diked areas due to flood diversion towards recipient water bodies (sea/terminal lakes.)

97. Flood management includes upland-watershed reforestation and soil conservation; flood monitoring, forecasting and warning; flood zoning and land-use management (e.g., farming restrictions coupled with compensation). These are usually cheaper and often more cost effective

than structural flood protection. Thus, the trend is that donors—including the Bank and JIBC/JICA—advocate a mix of light structural investments (e.g., repair and maintenance of existing embankments, storm and sewer drains) complemented by flood-management investments. Examples include the JICA-assisted flood forecasting/warning service within the Philippines Atmospheric, Geophysical and Scientific Administration (PAGASA); availing areas in Pampanga, Agno, Cagayan, and Bicol. The World Bank has provided grants up to $1 million for flood-management plans in Ormoc, Leyte, Bataan, Camiguin, and Aguasa. Non-structural investments should also address the irrigation-flood correlated measures, including storage improvement in lakes/canals/reservoirs; through dredging (e.g., following DENR guidelines) and through supporting market-driven quarrying of sand/gravel sediments.

98. DPWH is mandated for 'trunk' flood control and mitigation but co-ordination between DPWH and NIA is lacking in rural areas, as with LGUs in urban areas. DPWH has mainly concentrated on structural flood control in the lowlands. More attention needs to be given to non-structural measures in the lowlands and in the uplands to better manage and control flooding. Deciding which flood control/management measures are to be taken by which agency, and in which area, is an important requirement of IWRM. In future the Bank will support GoP in developing projects to test flood-mitigation (i.e., a mix of structural and management investments) measures by relating them to the beneficiaries. RBM is a good mechanism to proceed through that approach. A flood mitigation component of the RBWMP is currently at the stage of concept review. As for urban flood control, many of the urban centers are in coastal areas where poor drainage is a major problem affecting urban residents during the monsoon season. It is common in many LGUs to have commerce disrupted in the population or downtown areas because of four to five hours of backwater inundation. Some of the severely inundated LGUs have begun taking initiative in solving the flooding problems through borrowings from government financial institutions. Cabanatuan city, for example, has borrowed almost $10 million from the Bank-financed Water Districts Development Project to install drainage and sewerage infrastructure.

Issue 7. Opportunity costs, raw water pricing and demand management.

99. The two main WRM recommendations of the GoP Background Paper for the upcoming Third Water Conference are (i) to reform NWRB and streamline WRM Institutions; (ii) to develop a method and procedures for raw water pricing. The three Dublin principles mentioned earlier in this CWRAS allow that the rules of optimal economic or efficiency pricing be supplemented by other considerations in determining raw water allocation and water services between different users. The costs of water resource management and the development of new sources of raw water are the long run marginal costs of supply and hence very important. They will have to be financed in the future—but at present the basic and the seasonally constrained resource, raw water, is treated as a free or merit good. Coordination between resource management in the "long hydrological cycle" and the "short cycle" of service entities is needed since sources of raw water are a major problem during droughts and in particular basins. The Bank should support GoP water pricing policies and compliment a recent ADB study on the subject.

100. The Medium-Term Philippine Development Plan in the Conference background paper calls for the development of a pricing mechanism which takes into consideration cost recovery—revenue must be retained to finance WRM overheads, repay old loans and meet the marginal costs of new supplies. The Water Code explicitly allows NWRB to levy *"reasonable fees or charges for water resources development from water appropriators except when it is for purely domestic purposes."* Charging farmers the opportunity cost of raw water (the value urban consumers attach to marginal consumption) is not politically feasible. Politics and equity conflict with the logic of opportunity cost pricing. The egregious misallocation between high value marginal uses for Municipal and Industrial (M&I), and much lower values in agriculture need to be addressed but the transactions costs must be limited.

101. The Bank should support efforts to develop transferable water rights in critical water conflict areas where urban water stress is most severe and demand management through water rights transferring is the

most cost-effective solution. If the populations concerned are not large, higher cost source development or impoundment may make more sense. In many areas there is sufficient water even in the dry season, although pollution of surface or groundwater could affect availability. In areas where water scarcity and competition are serious issues, transferable rights are a means of reallocation with equity goals and allocative or economic efficiency (based on willingness to pay.) The position on equity is that the farmers "own" the rights and hence must be compensated. Determining the appropriate compensation will not be straightforward and will require negotiation facilitated by third parties. The alternative of making all sector users pay the same opportunity cost is not practical. Any standard for pricing of raw water is further complicated by the widely differing marginal values for urban and irrigation users during wet and dry years, at different times of the year, and in different watersheds. In the wet season marginal increases in raw water supply (delivered by Nature) can even have a negative value by causing floods. The Bank supports the GoP position that *"an approximate opportunity cost component is not recommended for raw water pricing and instead transferable water rights."*[11] The imperative is implementing a charge to support the costs of IWRM and development, and not economic pricing. Government does not have the fiscal resources and donor support is not as sustainable as raw water charges. Final prices are so distorted and domestic tariff increases so politically constrained, that an adequate short-term guideline may be to set the tariff as high as is politically feasible, and then keep raising it in increments. Any feasible dry season price for raw water is almost certain to be below the implied value to marginal consumer at times of drought.

102. To the extent that a raw water price feeds through to urban tariffs it is another tool for demand management and cost-recovery. The 3 components of a raw water price are usually defined as:

- *A charge to cover the full financial costs of providing access to water,* including the costs of developing, operating, and maintaining the water infrastructure;

11. Background Paper

- *A water resources management charge,* which can apply to the use of rivers and other water bodies for waste disposal as well as to water consumption. Funds generated can be used to support water management, conservation, and research;

- *A resource conservation charge that can be applied where a particular water use* significantly affects others in the basin. This charge reflects the opportunity cost (or value in best alternative use) and is the scarcity value of water in a water-stressed area.

The most compelling arguments for using tariff for demand management is that it is usually a more cost-effective way of bringing supply and demand into equilibrium than developing new sources. An increase in tariff will, other things being equal, both reduce demand and increase long term supply.

103. The first two are cost-based and both easier to estimate and implement. The opportunity cost is the third component. The Bank supports GoP's position in the background paper that *"it is more important to first get the procedures in place for effective implementation and administration of a raw water charge based on simple cost recovery for water resources management activities rather than attempting a complex pricing methodology that is not widely practiced."* The most likely scenario for developing new sources of bulk water supplies and/or matching demands to existing supplies is that of a private BOT or a corporate-like RBO, which would have full cost-recovery from the users anyway.

104. Whether or not raw water price is the main or only a minor determinant of final tariffs, depends on many other factors. Most of the existing infrastructure for supplying raw water (such as dams) are owned and operated by an agency (NIA, NPC or MWSS for instance) which already pay the costs of facilities. But the tighter the constraint on new sources (increasing costs of development), the greater will be the importance of a raw water charge to equalize supply and demand. For instance the present urban tariff for Cebu is about US$0.50/m3 while in Manila it is closer to US$0.10. There are costs on the supply side which could be more important (the costs of service provision, grants, investment

subsidies and network costs for instance.) Whether for recovering these costs or for equating supply and demand, an independent third-party may conduct hearing petitions to expedite the approval of the tariff increase needed. Similarly, and especially for equating demand and supply across the water-using sectors by imputing a *resource-conservation* signal on the raw water price, IAs should participate in the decisions on raising the (bulk) irrigation-water prices, to bail the politicians out from protecting the agricultural sector merely for the sake of political interests at the expense of the allocative efficiency and sustainability of the resource base.

105. In practical terms the difficulties that will be encountered by NWRB administering a scheme for raw water pricing are great enough to make protracted debate on economic methodology of only slight relevance. Water rights, measuring devices and data management capacities are largely undeveloped, requiring substantial investment in the future. The general principle should be that funds generated from the raw water charge pay for the programs and services for water resource management. Improving cost accounting and corporate governance will be of as much importance as estimating opportunity costs. A simpler option might be a single standard charge for 6 months of the year (e.g., US$0.02/m3) that would only be introduced after a campaign to explain the logic and rationale of water prices (public awareness and education.)

V. Summary

106. The CWRAS addresses both WRM and water-using sector issues which themselves link to WRM. The key elements of the Philippines CWRAS are:

- Founding WRM on institutional mechanisms that ensure economically efficient, equitable allocation of water resources and environmental sustainability.

- Supporting WRM through decentralization and community driven development and assisting local governmental institutions to assume accountability for developing and providing water related services.

- Selectivity and focus on a few key long term WRM issues—IWRM at the river basin level, demand management (esp. raw water pricing), water rights and discharge control, water transferring, improved system level management, conjunctive use of surface and groundwater and wastewater reuse.

- Tying future Bank loans for hydraulic infrastructure to management improvements and reform progress.

- Linking river basin management with decentralized regional and local government structures and new financing mechanisms.

- Integrating NWRB into DENR and strengthening NWRB capacity in coordination, monitoring, planning and regulation of water resources while preserving the environment.

- Supporting GoP in addressing serious water quantity and quality management issues in critical regions including the preparation and implementation of Strategic Action Plans for Manila/Angat Basin/Laguna de Bay and Cebu.

- Testing of simple methods for pricing raw water.

- Testing transferable water rights for the Angat Basin (for Manila) and Cebu.

- Supporting irrigation management transfer and irrigation management reform.

- Supporting improved water supply and sanitation in major and secondary cities and in rural areas.

- Supporting flood control and management, watershed management, and coastal zone management within the context of river basin management.

- Supporting improved dam safety and reservoir operation.

Ongoing and potential future Bank-supported water program in the Philippines

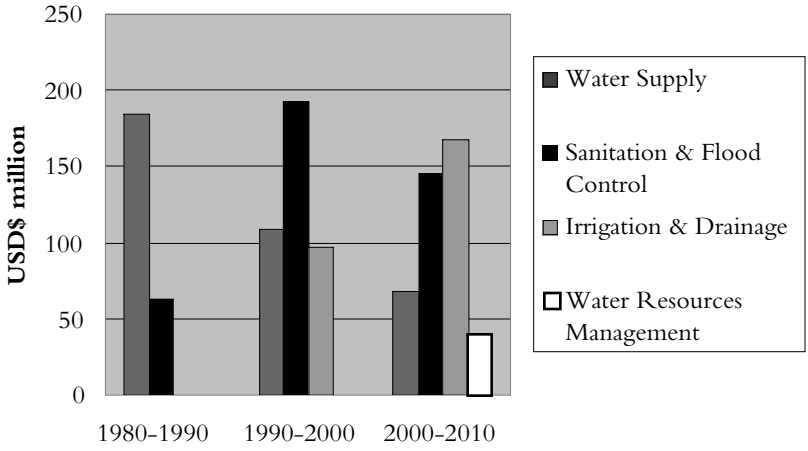
Aspects/ Sub-sectors	Lending Operations: Investment Lending	Lending Operations: Adjustment Lending	Non-lending (AAA/TFs/ Small Grants Program)	Innovative WRM and development outputs	Timeline
Irrigated Agriculture	1) WRDP		NIA/IAs/CIS-LGU capacity building, RBM, transferable rights, water pricing, irrigation benchmarking, review of IMT and financial incentives	Piloting volumetric pricing, IMT, simplified/equitable irrigation flow structures, conjunctive use	1996-2004
	2) Irrigation Sector Loan (PIDP)				Proposed
		3) Public Sector Reform Loan		Partially mobilized for) NIA re-structuring and IMT	2006
WS&S (& urban flood control)	1) LGU WS&S		LWUA restructuring, LGU capacity building, demand-based water transfers and raw water pricing	New financing mechanisms under improved corporate governance (demand-driven financing to support commercialization and privatization)	1997-2010
	2) WDDP		Awareness campaign on water supply and water tariffs	Demand-driven sewerage/ drainage in secondary cities	2001-2006
	3) Manila Sewerage III		MWSS-concessionaire project management	Sewerage rehab & sanitation collection/disposal	Under Preparation

(continued next page)

Ongoing and potential future Bank-supported water program in the Philippines (continued)

Water Policy & IWRM (including watershed/coastal/ aquaculture/flood management)	1) RBWMP I, II, III	GEF for watershed management	Piloting RBM/RBO for sustainable use, transferable rights, demand management, flood mitigation; NWRB capacity building	Under Preparation long-term program (first 2004-2009)
	2) LIL/SIL Laguna Institutional strengthening and community participation	GEF Land-Based sources of marine pollution, other TFs and small grants	Multi-sector water (quantity and) quality management	Preparation (redesign)

Figure 2. Bank contribution to water-related projects in the Philippines (including pipeline)



Project ID	Project title	Start date	Completion date	Bank commitment $m	Project cost $m	Instrum./ status
P004470	Provincial Water Supply Project (02)	1979	1987	38	38	SIML
P004573	Municipal Development Project (02)	1989	1995	40	40	SIL
P004592	Municipal Development Project (03)	1992	2000	68	114	SIL
P069916	Manila Sanitation and Sewerage Project	1980	1988	63	63	SIL
P004413	Manila Metropolitan Water Supply Project	1964	1970	20	20.2	SIL
P004561	Water Supply, Sewerage & Sanita. Proj. (01)	1990	1997	85	85	SIL
P004497	Rural Water Supply and Sanitation Project	1982	1990	36	35.5	SIL
P004471	Manila Water Supply Project (02)	1978	1985	88	88	SIL
P004539	Metropolitan Manila Water Distribution	1986	1993	69	69	SIL
P004453	Provincial Cities Water Supply Project	1977	1983	23	23	SIL
P004611	Manila Sewerage (02) Project	1996	2004	57	76.2	SIL
P004574	Angat Water Supply Optimization Project	1989	1995	40	40	SIL
P004613	Water Resources Development Project	1996	2004	58	85.2	SIL
P004572	Communal Irrigation Development Project (02)	1990	1999	46	64.4	SIL
P069491	LGU Urban Water and Sanitation Project (02)	2001	2006	30	35.3	APL
P039022	LGU Urban Water and Sanitation Project	1998	2004	23	33.3	APL
P004576	Water Districts Development Project	1997	2004	39	80.7	SIL
P074774	Laguna Inst. Strength. & Comm. Particip. Proj.			4.7	10.8	Redesign
P004589	Irrigation Operation Support Project (02)	1993	2000	51	69.6	SIL
Pipeline	Manila Sewerage (03) Project			50	60	SIL
Pipeline	Participatory Irrig. Dvlp. Proj.			110	137	Pre-concept
Pipeline	Bicol River Basin & Watershed Mgt Proj.	2004	2009	35	54	Preparation
P004595	Community Based Res. Mgt Proj.	1998	2004	50	67.5	SIL
P071007	Agrarian Reform Comm. Dvlp. (02) Proj.	2002	2007	50	74.8	SIL