

Finding Solutions to Asia's Water Challenges through Integrated Water-Resources Management

(Background Note Issued Prior to the Meeting)

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Introduction

This paper is an overview of the rising challenges for water-resources management facing the nations of Asia today. It summarizes the problems, essential principles and steps toward finding solutions. It also suggests options for regional cooperation.

During the twentieth century the world's population tripled while the total water withdrawals from natural sources increased about 7 times (GWP 2000). The UN predicts that over the next 40 years, 90 million people will be added to the world's population each year. World population will grow from 6 billion today, to 8 billion in 2030 to 10 billion in 2050. The World Bank predicts that there will be a 650-percent increase in demand for water over the next 30 years (Serageldin 1995). It has been forecast that, if present trends continue, by 2025 more than 3 billion people will be under conditions of water scarcity (i.e., having insufficient water for basic domestic and/or productive needs [Prince of Orange 2002]).

Water Problems in Asia

Most people who will experience water scarcity in the future will be in Asia, which has 58 percent of the world's population but only 26 percent of the total global runoff of freshwater (Simmons 1991). This is only the physical dimension—economic and institutional constraints add further stress, especially for the poor. Over the past 50 years, per capita availability of water has decreased by 60 percent in North Asia, by 55 percent in Southeast Asia, and by almost 70 percent in South Asia (ADB 2001).

Availability of clean water for drinking and sanitation is a major factor for health or disease, especially for the poor. Worldwide, 1.1 billion people do not have access to water supply facilities—63 percent of these are in Asia, where one-third of the population does not have access to safe drinking water within 200 meters of their home. Of these people, 700 million live in rural areas and 90 million in cities (ADB 2002).

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Worldwide, about 2.4 billion people lack hygienic sanitation facilities—80 percent of these are in Asia. Each year, millions die or are put out of work from diarrhea, malaria, dysentery, parasites and other water-related diseases. It is the poor who are the most vulnerable to water shortages, lack of drinking and sanitation facilities, and natural disasters. Asia has, by far, the world's largest concentration of people in poverty. There are approximately 1 billion people in Asia who survive on the equivalent of US\$1.00 per person per day (Soussan 2002).

In developing countries 70–80 percent of accessible freshwater is used for agriculture. Approximately 40 percent of the world's food is produced on 17 percent of the cultivated land that is irrigated (Serageldin 1995). In Asia, about 40 percent of the cultivated area is irrigated, which produces about 80 percent of the region's food supply (ADB 2001).

During the late 1980s and 1990s, crop yields for most basic cereal crops leveled off. Between 1950 and 1990, the world's average annual grain yields rose by 2.1 percent per year, but this dropped to only 1 percent during the 1990s. At this rate, it would take 70 years for the total world grain production to double!

The Food and Agriculture Organization of the U.N. has reported that 60 percent of the additional food needed to meet the needs of the earth's growing population through the year 2050 will have to be produced on irrigated land (FAO 1996). China's Ministry of Water Resources has estimated that at least 50 percent of future required increases in agricultural production can only be obtained through improvements in the management of irrigation systems (MWR 1996).

However, population increases, economic diversification and environmental degradation are rapidly increasing competition for farmland and water. Water is a key factor of production for manufacturing, industry and hydroelectricity in diversifying economies. Demand for water for domestic, municipal and industrial use is growing rapidly in Asia. This demand is projected to increase at a rate between 70 percent and 345 percent between 1995 and 2025. Industrial water use is expected to increase by 700 percent in high-growth areas near cities in Asia. The ADB predicts that this will increase water pollution loads in these areas by about 16 to 18 times for suspended and dissolved solids and biological pollution (ADB 2001). This would have severe consequences for humans as well as plant and animal life.

Today, cities and factories are taking water away from irrigated agriculture. In the densely populated island of Java, the spread of cities, towns and factories cause the disappearance of about 10,000–20,000 hectares of irrigated riceland each year. Demographic and economic changes are racing ahead of institutional development. A modern system of water rights, regulations to protect water quality and effective conflict-resolution arrangements are needed to deal with these problems, but they are not in place yet.

It has been estimated that, worldwide, 1 in every 5 hectares of irrigated land is losing productivity due to increasing salinization of soil (Postel 1999). Salinization is particularly serious in Pakistan, India, the north China plain, Iran, Iraq, and Central Asia. Salinization of irrigated farmland is estimated to be spreading at a rate of approximately 2 million hectares per year (Umali 1993). This costs the world's farmers about \$11 billion in loss of income due to declines in productivity (Ghassemi et al. 1995). Salinization is aggravated by poor management of irrigation and drainage systems.

Drawdown of aquifers is caused by pumping water at rates faster than natural recharge. It is already a serious problem in India, Pakistan and China, where underground water tables

have been dropping over the last 30 years at rates of between 0.5 m/yr. and 1.5 m/yr. Deep funnels devoid of groundwater are expanding underneath China's major cities.

Seckler et al. (1998) estimated that approximately one quarter of India's grain production could be under threat from depletion of groundwater caused by overextraction of the annual renewable supply. It has proven difficult for governments to regulate against unsustainable levels of extraction of groundwater by farmers. Clearly, resource users must be involved in curtailing unsustainable practices if the problems are to be dealt with effectively.

There is evidence, linked to global warming, watershed degradation and unplanned urbanization, that droughts and flooding are becoming more frequent and severe. It is estimated that, in an "average year," Southeast Asia experiences the destruction of approximately 4 million hectares of agricultural crops (Simmons 1991). It has been estimated that, between 1990 and 1998, the People's Republic of China amassed an estimated US\$66 billion in damages caused by flooding (ADB 2001). About 3,600 people died in the flooding in 1998 alone. The poor were affected the most.

One result of these demographic, economic and environmental pressures is that the irrigated land per capita has decreased by 5 percent since 1978 (Rosegrant 1997). Despite the likely 650 percent increase in global demand for water by 2030, except for a few possible but costly interbasin water transfers, and possible effects of climatic change, the annual renewable supply of water in river basins and underground aquifers is fixed. The logical conclusion then is that the overriding challenge for the world's irrigated agriculture now and in the future is, "How can the world produce more food with less water and less agricultural land?" There is general agreement among the experts that the world is already in "a chronic, pernicious crisis in the world's water resources" (Cosgrove and Rijsberman 2000). Solutions to Asia's water problems need to be found and applied urgently.

Obsolete Legacies

The construction era of development from 1950 to the 1970s, and the green revolution, have left a legacy of oversized, under-financed and poorly performing bureaucracies; overly standardized, top-down procedures; highly fragmented and sectorized agencies; natural resources agencies based on administrative rather than environmental boundaries; lack of coordination; lack of accountability between policy, agencies and resource users; and lack of capacity for community organizations to manage water resources locally. This paradigm considered the government as the engine for development. Rural people were mere beneficiaries, dependent for their welfare on standardized packages of inputs provided by the government.

The consequence of lack of integrated management of river basins has been, in the words of the new ADB (2001) water policy,

*...increased water scarcity; poorer public health; lower agricultural yields;
...declining quality of aquatic life in lakes, rivers, and coastal waters
Forests get depleted, biodiversity is lost, catchment areas deteriorate,
flooding is frequent, and groundwater recharge is diminished.*

Furthermore, as landlessness increases, the livelihoods of the poor become even more precarious.

From the 1970s to the present, the emphasis on government-sponsored training, modernization of technologies and management methods has not produced expected results. By contrast, it appears that the rapid spread of lift irrigation, treadle pumps and other on-farm technologies was often driven more by farmers and market forces than by government programs (Rijsberman 2001).

By the 1990s, water professionals realized that something more fundamental was lacking in the world's irrigation-development strategies. The general lack of successful or sustainable adoption of two decades of technocratic and managerial recommendations and pilot projects caused water professionals to turn their attention more to underlying institutional deficiencies in the water sectors of countries in the Asian region.

The Global Water Partnership's "Framework for Action" (GWP 2000) asserts that the causes of the world water crisis are mainly social and institutional, while the physical and technical manifestations are more the symptoms. The Framework for Action states:

The water crisis is mainly a crisis of governance. The present threat to water security lies in the failure of societies to respond to the challenge of reconciling the various needs for, and uses of, water.

So the search is on now for new and more effective institutional models for regulation, governance, financing and service provision for irrigation systems, river basins and water supply, sanitation and treatment systems.

Principles Adopted in Recent International Fora

The 1990s were the "water decade" for the United Nations. In 1992, the International Conference on Water and Environment in Dublin adopted a set of four basic principles (box 1) that defined water as both a social and an economic good essential for sustainable development and environmental conservation and that equitable access and efficient use of water could only be assured through participation of stakeholders in the governance of water resources.

The second World Water Forum (2nd WWF) held in The Hague in March 2000 brought together 5,000 water stakeholders that included 100 ministers from around the world and produced various new principles and objectives, as embodied in the World Water Vision, the Framework for Action and a Ministerial Declaration. The Forum adopted the key goal of *water security*. This was interpreted to mean that people have adequate access to water for basic needs and productive uses, are protected from water-related dangers and have access to a fair process of conflict resolution. The Forum also emphasized the theme that *Water is everybody's business*—meaning that all stakeholders should have a right to participate in the governance of water resources.

The Ministerial Declaration identified seven priority challenges for the water sectors of the nations of the world (box 2). The Declaration also stated that, "combating poverty is the main challenge for achieving equitable and sustainable development, and water plays a vital role in relation to human health, livelihood, economic growth as well as sustaining ecosystems"

Box 1.

Dublin principles on water (1992)

1. Freshwater is a finite and vulnerable resource, essential to sustain life, development and the environment.
2. Water development and management should be participatory, involving users, planners and policymakers at all levels.
3. Women are central to providing, managing and safeguarding water.
4. Water has an economic value in all its competing uses and should be recognized as an economic good.

Box 2.

**Seven challenges in Ministerial Declaration, 2nd WWF
(March 2000)**

1. Access to safe and sufficient water and sanitation are basic *human needs* to be ensured.
2. Ensure *food security* through efficient and equitable mobilization, use and allocation of water.
3. *Protect ecosystems* through sustainable water-resources management.
4. Promote *cooperation and synergy* between different water users at all levels and across all boundaries.
5. *Minimize risks* from floods, droughts, pollution and other water-related hazards.
6. *Valuation and pricing* of water that reflect value of all uses and costs of service provision, while protecting the basic needs of the poor.
7. *Good governance* of water resources through more accountable public agencies, community empowerment and participation of all stakeholders.

(Soussan 2002). The role of water in poverty alleviation and development has become an important theme for the forthcoming 3rd World Water Forum to be held in Kyoto in March 2003.

A specific set of measurable objectives for water was included in the International Development Targets adopted by the UN Millennium Assembly in October 2000. These were to achieve the following by the year 2015:

1. Reduce by half the number of people who do not have access to safe drinking water.
2. Increase the productivity of agriculture per unit of water consumed (from rain and irrigation) to ensure food security for all people without increasing the water diverted for agriculture over the level diverted in 2000.

A third target is now being proposed, to reduce by half the number of people who do not have access to sanitary facilities.

Many hold the view that since water is essential for basic human needs, it should be considered as a human right that should be formalized into legal water rights. This would apply for both domestic use (about 30–50 liters per capita per day) and productive uses for people who depend on it for their basic livelihoods, such as small farmers or water-dependent small industries.

After extensive analysis by experts and consultations with stakeholders, ADB has recently adopted a water policy which espouses the following priority elements:

1. *Promote a national focus on water-sector reform.* ADB will help its member countries formulate national policies and legislation and conduct strategic planning for reform.
2. *Foster IWRM.* The ADB will promote comprehensive water-resources assessments, plans, investments and institutional development focusing on the river basin as the primary unit for water management.
3. *Improve and expand the delivery of water services.* ADB will promote the development of autonomous and accountable water-service providers (especially for water supply, sanitation and irrigation and drainage), a larger role for the private sector, and new public-private sector partnerships, subject to the fulfillment of the basic needs of the poor and disadvantaged.
4. *Foster the conservation of water and increase system efficiencies.* ADB will support actions to finance water management on a pay-for-service basis, which also include payment of the costs of environmental conservation. It also intends to build the capacity of governments to regulate and increase public awareness.
5. *Promote regional cooperation and increase the mutually beneficial use of shared water resources within and between countries.* ADB's main priority here is to support the exchange of information and experiences about water-sector reform and the move toward IWRM.

6. *Facilitate the exchange of water-sector information and experience.* Stakeholder consultation and participation and enhanced monitoring, evaluation, and research will be promoted, especially in public organizations.
7. *Improve governance.* The ADB will promote decentralization, community empowerment, devolution, and new measures to improve accountability.

Key Challenges for Water Sectors

The following is a list of the most important challenges facing the water sectors (and societies, economies and environments) of the nations of Asia today. There are not many human endeavors more noble and urgent than finding solutions to these difficult questions.

1. How to mobilize sufficient funds for needed development and management of water-service facilities?
2. How to reduce water pollution to acceptable levels and maintain acceptable standards of water quality?
3. How to substantially reduce the number of people without access to safe water supply and sanitation facilities (such as by 50% by 2015), thereby alleviating many of the health problems associated with water?
4. How to ensure food security through substantial increases in the productivity of water used for agriculture (in the context of having less water available for agriculture)?
5. How to improve both the efficiency and equity of water allocation and use among all users within river basins?
6. How to reduce the risks and effects of floods, droughts, erosion, and waterborne diseases to “acceptable levels”? And, what levels are both acceptable and feasible?
7. How to reverse unsustainable environmental degradation in catchments and river basins and ensure the adoption of sustainable management practices for water and land resources?

Solutions to these challenges will carry high costs, both financial and political. But the costs of failure to address the challenges would be much higher. As an indication of the magnitude of the investment required, Bhatia (2002) has estimated that, for South Asia alone, the cost of investments for water infrastructure and management to achieve goals consistent with the above international principles would be roughly US\$420 billion (in 1997 dollars) over the next 25 years. This would be used, approximately, as follows:

- for urban water supply, sanitation and wastewater treatment 39 percent (\$164 billion)
- for treatment of industrial effluents 16 percent (\$68 billion)
- for “food-security investments” (including irrigation, drainage, watershed development and management and flood control) 26 percent (\$112 billion)
- for rural water supply and sanitation facilities and services 18 percent (\$76 billion)

In addition to the challenge of how to mobilize sufficient funds to cover these water-sector costs, governments must also learn to be more efficient with how the funds are used. Governments cannot afford to continue to provide subsidies that discourage local investment and that flow to the more wealthy and powerful. The widespread vicious circle of construction of water infrastructure, underinvestment in maintenance, deterioration and premature rehabilitation must be replaced with arrangements that ensure adequate maintenance.

In a study of financing irrigation maintenance in eight sample schemes in South and Southeast Asia, Skutch (1998) has estimated that the annual net benefit of providing satisfactory funding for maintenance,² versus typically inadequate levels, is between \$50/ha and \$100/ha (in 1992 dollars). For a scheme of only 20,000 hectares, the net benefits of changing from inadequate to satisfactory maintenance would be \$1 to \$2 million per year.

A 1994 study by the World Bank estimated that the rates of return to satisfactory maintenance are potentially 40 percent (World Bank 1994).³ The main issue for achieving adequate maintenance of water infrastructure is how to create the right incentives and accountability measures to mobilize and dedicate sufficient funds for it (as opposed to deferring maintenance in favor of cyclical rehabilitation).

6. IWRM

There is consensus among all major technical assistance, research, lending and donor organizations that IWRM is the essential organizing concept within or through which solutions to water problems must be found.⁴ The Global Water Partnership defines IWRM as:

²Satisfactory maintenance is defined as the level of maintenance required to prevent the need for premature rehabilitation during the expected design life of the irrigation system.

³This is enough to supply over 25,000 persons with a safe source of drinking water (at the World Bank estimate of \$150/person).

⁴IWRM is the avowed philosophy of the World Water Commission, Global Water Partnership, 1st and 2nd World Water Forums, UNDP, FAO, World Bank, ADB, OECD, EU, IWMI and others.

...a process which promotes the coordinated development and management of water, land and related resources, in order to maximize the resultant economic and social welfare in an equitable manner without compromising the sustainability of vital ecosystems (GWP 2000).

IWRM, in contrast to conventional sectorized, fragmented and uncoordinated management aims to integrate, or bring together all water and land users; other stakeholders; physical, biological, and human components of water resources; political or administrative levels or units; and policy, legal, institutional, managerial, and technological aspects of water resources into a common process of analysis, negotiation, consensus building, decision making and management. The objective of IWRM is to find an optimal balance between water use for livelihoods and conservation of the ecosystem within which water resources are used and replenished.

IWRM promotes the following principles:

- comprehensive and dynamic accounting of water supplies and demands
- analysis and management of the river basin as an ecosystem
- internalization of externalities created by users within the framework of an integrating river-basin organization and management system
- representative participation of all water users and stakeholders in decision making about water allocation, use rights, service delivery and conservation of the ecosystem
- coherent linkages between resource regulation, governance, financing and service provision—all of which are subject to the requirements for environmentally sustainable resource use
- a single and clear system of measurable and verifiable water rights
- practical fora for negotiation, agreements, rules, and transparent mechanisms and incentives to ensure accountability of stakeholders to these

As mentioned above, many institutional legacies remain in Asian countries that are now obsolete and are incompatible with the concept of IWRM. Therefore, basic restructuring and reform will be normally required at the policy, legal, planning, administrative, field operations and community levels—in order to enable governments and societies to use IWRM to find and apply solutions to their water challenges. Each country that has the political commitment to apply IWRM to its water challenges will probably have to take the following bold actions:

Action 1: Establish a supportive policy and legal framework

A country that wishes to adopt IWRM should have a clear, high-level and comprehensive set of policy declarations and legislation. The policy and legal framework should establish the goals, functions, institutional changes and assignment of responsibilities and rights needed to enable the adoption of IWRM, which deals with a vital and politically sensitive resource, in a manner that cuts across conventional sectors and jurisdictions. It will impose new financial obligations on society and restrictions on politicians.

Therefore, the status of IWRM framework policies and laws should be at the upper end of the hierarchy of legal issuances within a country. The framework should be comprehensive, so that it deals with all aspects of sustainable governance and management of water resources and is linked effectively to related sectors and laws.

Normally, there should be an apex policymaking and planning body at the national level, such as a national water council. It should consist of representatives from all water-related sectors, including civil society. In large federal states, such as China or India, such councils may be needed at the state or province level. In addition to policymaking, one of its priorities would be to mobilize sufficient resources at the national or province level for the necessary capital costs of needed water infrastructural development.

Action 2: Restructure government agencies

Governments will need to transform centrally financed agencies from old-style bureaucracies into client-oriented organizations that effectively regulate water resources management, promote cooperation between sectors that use water, and build local capacity. Government agencies will often need to be restructured so that they will be motivated to provide efficient and quality services according to the priorities of their principal clients—water user groups, utilities and companies.

The following are the most common strategies for transforming government agencies into accountable, service-oriented organizations:

- *Decentralize*, consistent with the subsidiarity principle, so that decision making is done at the lowest level at which pertinent information and interests are manifested;
- *Devolve* implementation and management functions to community-based organizations, NGOs, and the private sector.
- *Restrict* the mandate of agencies to essential regulation, capacity building, and facilitating choice among service providers and open access to markets.
- *Convert* centrally financed organizations into self-financing public utilities.
- *“Right-sizing”* of oversized bureaucracies through early retirement programs and *retrain* and *redeploy* staff for new functions.

Agencies that are resistant to change should be brought into a serious, interdepartmental, participatory and transparent process of strategic planning. Generally, agencies do not volunteer to do this, nor are they capable of doing it by themselves. IWRM cuts across conventional sectoral agencies. High-level commissions or task forces are often needed to carry out strategic planning and restructuring.

Reform does not necessarily mean serious downsizing and loss of budgets. There are important future roles that need to be performed by governments under the new IWRM paradigm, such as enhanced regulation and monitoring, higher-level environmental management functions (e.g., moving upstream from irrigation systems to river basins), data analysis and capacity building. Strategic planning commissions or task forces facilitate the formulation of common visions for reform among government officials and other stakeholders. The recent irrigation-sector reform program in Andhra Pradesh, India and the current Irrigation Sector Policy Reform process in Indonesia are examples of this approach.

Action 3: Establish river-basin organizations for governance and management

Governments will need to establish at least two kinds of organizations at the river-basin level. Their jurisdictions should be based on the hydrological boundaries of the river basin, not crosscutting administrative boundaries. The first kind is the organization that will *govern* the river basin. Governance includes the functions of:

- setting policies and rules for the management of the river basin
- defining what water and environmental services should be provided and at what standards of performance
- determining under what terms and conditions (including financial) the services will be provided

Following the principles of stakeholder participation and community empowerment, the governing authority should involve river-basin stakeholder groups in fora for public consultation, consensus building and decision making.

The second type of organization required is *management* entities that will provide the water and environmental services, under the supervision of the governing entity. In some cases, it might make sense to have only one management entity that provides most or all services. In other cases, it may be more efficient to unbundle service provision and have different services provided by different entities.

In addition to governance and management organizations, a government agency, at a level above the river basin, should *monitor* and *regulate* river-basin governance and management, to ensure that they are consistent with government policy and law. Governments should promote enhanced information collection, analysis and sharing.

Action 4: Implement community empowerment, capacity building and management devolution

Devolution is the transfer of authority and responsibility for management of resources from government agencies to the private sector or to community-based organizations. Normally, this includes assignments of new water and/or land rights to local entities, such as water user associations (WUAs), irrigation districts or mutual companies. Sometimes it is called privatization or management transfer. In the 1990s it became widespread in many sectors, including those as diverse as telecommunications, transportation, irrigation, forestry, and even agricultural extension (in Mexico).

The rationale for doing this is that the private sector must operate according to the discipline of financial viability. Services must be provided according to the demands of customers. The private sector and community organizations have the incentive to be efficient. And it is thought that users of irrigation systems and forests have more interest than anybody else in protecting the long-term productivity of their resources.

Devolution can involve local communities in essential conservation and management tasks, reduce managerial and financial burdens on the government, and encourage private-sector investment in development and management of water resources.

Action 5: Create new partnerships based on mutual accountability⁵

Under the IWRM paradigm, the government no longer sees itself as the main engine of development. It lacks the resources to directly implement, manage and control all water-resources management and development. Its new roles will increasingly be to regulate, plan and build capacity in communities, WUAs and private-sector management entities (ADB 1996).

Under the new partnership, public consultation and other communication fora are promoted so that the government can be responsive to priorities identified by stakeholders. Water-resources management is structured as a partnership between water users, the government and third parties, where transparency, negotiation and agreements are made among all parties concerned. Participatory planning fora are established at the district or regional level. Accountability between the government and the stakeholders is promoted through supportive incentives, service plans and agreements, management audits, asset management plans and financial incentives.

Enhanced government regulation is needed to protect the interests of society in the context of increasing commercialization and off-farm employment. Rural people who want to develop water-related businesses require the support of the government to become strong, legal entities. They need a new partnership with the government and the private sector to come out of relative isolation and be able to articulate with the broader commercial world, to have access to new markets and market information.

⁵The ADB (1999) identifies accountability, participation, predictability (of rules and their application) and transparency as the four elements of good governance in development. For our purposes, we consider predictability and transparency as aspects of accountability, broadly defined.

The new partnership emphasizes the creation of local property and property rights through investments by the civil society and the private sector. When rural people invest in irrigation maintenance and improvements they establish rights to water, rights to acceptable service provision and rights to use the infrastructure. As opposed to loan-based development, the new paradigm encourages rural people to make their own investments in infrastructure, agriculture, small or micro business development, etc.

Action 6: Apply social and economic valuation and charging for water and environmental services

Economic valuation of water services is needed to promote efficiency in water use, to provide revenue to support private-sector investment, to encourage allocation of water to highest-value uses, to discourage generation of externalities (such as pollution), to provide incentives for compliance with government policy and to provide revenue to cover the costs of environmental conservation and protection against natural disasters. Special social valuation and charging can be applied to ensure that the poor or disadvantaged have access to water for their basic needs.

Action 7: Redesign government investment to stimulate community and private-sector investment

Government subsidies are restructured into investments meant to stimulate rather than discourage local investment and self-reliance. This happens when subsidies require matching investments and compliance with agreed performance standards by local groups, when property rights are clear, and when credit and creditworthiness are established among rural people, individually and in WUAs. At present, Indonesia is developing demand-driven district-level irrigation-infrastructure funds that provide financial assistance to irrigation systems on the basis of competitive selection of proposals, according to agreed criteria, such as the level of matching investments or outcomes of previous audits.

In Laos, the Nam Theun 2 hydropower project provides assistance to communities in the catchment area to improve management and conservation of the catchment ecosystem. Private water-supply companies in Manila, which have concessions from the government to provide their services but which can be profit-making enterprises, are investing in catchment management and conservation, to protect the resources base on which their enterprise depends (Bhatia 2002).

Action 8: Facilitate the development of multiple choices for service providers, sources of financing and markets

It is recognized that a comprehensive support system needs to be in place for IWRM. Governments should encourage the development of multiple water-service providers. These may be in the public, private and community sectors. No single service provider should dominate and people should have real choice among service providers, sources of credit and market outlets. It is expected that competition among service providers will encourage responsiveness and efficiency.

7. Opportunities for Support and Regional Cooperation

IWRM is a generic framework that can be adapted and applied to fit the variable needs and circumstances of each country in the Asian region. The seven challenges identified in section 5 above likewise apply to virtually all countries in the Asian region. In conclusion, they are listed again here as material for discussion:

1. How to mobilize sufficient funds for needed development and management of water-services facilities?
2. How to reduce water pollution to acceptable levels and maintain acceptable standards of water quality?
3. How to substantially reduce the number of people without access to safe water supply and sanitation facilities (such as by 50% by 2015), thereby alleviating many of the health problems associated with water?
4. How to ensure food security through substantial increases in the productivity of water used for agriculture (in the context of having less water available for agriculture)?
5. How to improve both the efficiency and equity of water allocation and use among all users within river basins?
6. How to reduce the risks and effects of floods, droughts, erosion, and waterborne diseases to “acceptable levels”? And, what levels are both acceptable and feasible?
7. How to reverse unsustainable environmental degradation in catchments and river basins and ensure adoption of sustainable management practices for water and land resources?

It would be very difficult and inefficient for each country to attempt to answer each one of these questions independently and in isolation. Although each country has obvious differences, they share the common need to apply an integrated approach to water resources management and they face, in common, most or all seven of the above challenges. The countries in the Asian region can benefit much from such cooperative activities as sharing information

about experiences; new ideas, methods and technologies to answer the challenges; joining together in workshops and training events at the regional level; exchanging expertise; conducting study tours; adopting a common set of requests for support and recommendations to technical assistance and donor agencies; and sharing a web site and a newsletter.

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