

Development of Effective Water Management Institutions

**Regional Study Implemented by the
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Towards Water Sector Reforms

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Foreword

The final reporting material of the overall study comprises four components, which are structured in terms of the four main study outputs expected in the IWMI-ADB Technical Assistance Agreement. The executive summary and the four output components are presented in five volumes of the Final Report:

Volume I	–	Executive Summary of the Final Report.
Volume II	–	Conceptual Framework.
Volume III	–	Case Studies of Advanced River Basins.
Volume IV	–	Country Studies and Action Plans.
Volume V	–	Towards Water Sector Reforms.

Volume V presents a brief comment on the study efforts to promote water-sector reforms in the participating countries, and five policy analyses country reports prepared by selected experts. Titles of the five policy reports and the names of their authors are:

- “China’s Efforts in Introducing Water Policy and Initiating Related Institutional Development for IWRM,” by George E. Radosevich.
- “Indonesia’s Water Sector Policy and Institutional Reform Process,” by Theodore Herman.
- “Implementation of Integrated Water Resources Management in the Philippines,” by Willie Barreiro.
- “Sri Lanka’s Efforts in Introducing Water Sector Policies and Initiating Related Institutional Development,” by V. K. Nanayakkara.
- “Thailand’s Efforts in Introducing Water Policy and Initiating Related Institutional Development for Integrated Water Resources Management (IWRM),” by Lien, Nguyen Duc.

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Chapter 1

Introduction

The 3-year multi-country study on “developing effective institutions for water management” was conducted by the International Water Management Institute (IWMI), with financial support from the Asian Development Bank (ADB). The objectives of the study were to assess the existing physical, social and institutional situation associated with water resources within selected river basins, and based on that assessment, to develop and initiate the implementation of policies and institutional strengthening programs that would lead to improved management of water resources. This was to be pursued in the context of integrated water resources management (IWRM), considering the river basin as the unit of analysis, planning and management.

Inception activities for the study started immediately after signing of the Technical Assistance Agreement with ADB in January 1999. IWMI, in consultation with the Bank and country partners, selected five river-basin study sites: Fuyang river basin in northern PRC; Ombilin subbasin of the Inderagiri river basin in West Sumatra in Indonesia; East Rapti river basin in Nepal; Upper Pampanga river basin in the Philippines, and Deduru Oya river basin in Sri Lanka (later, two river basins from Thailand, Mae Klong and Bangkapon, were added to the study). Each study team consisted of both researchers and representatives of implementing agencies. At an inception workshop held in Colombo in July 1999, the collaborating partners met and discussed a draft inception report prepared by IWMI. The consultation resulted in an agreed work plan and a set of methodologies for field work in each country.

As the October 2001 Review Mission acknowledged, although the project had proceeded satisfactorily to generate substantial interest in participating Developing Member Countries (DMCs) about IWRM and river basin management, its planned action phase was not complete, as most of the countries had encountered difficult political and administrative constraints during 2001. Recognizing the potential for institutional development, it was decided to reschedule the final regional workshop for 2002, and have the highest policy levels involved in it in order to increase the probability of seeing more productive outcomes from the project.

A number of National Policy Dialogues were held in each country; the one in Sri Lanka was held as a joint effort by IWMI and the National Water Resources Secretariat during 13-14 March 2002; the one in Nepal during 19-20 March 2002; the Philippines National Workshop during 17-18 April 2002; and the Indonesian workshop during 5-7 May 2002. One major achievement of the study during these consultations was its ability to mobilize considerable interest among policy-level persons in each country. This interest was consolidated specially through the Ministerial Roundtable Dialogue on Water Sector Challenges, Policy and Institutional Development held in Bangkok during 23-24 May 2002.

The Joint Statement agreed by the Ministerial Delegation elaborated on an earlier initiative on freshwater called for under the UN-ESCAP, ADB, UNEP Regional Phnom Penh Platform, held in November 2001, and was to be taken to the Ministerial Prep-Com meeting to be held in Bali, and incorporated into the agenda of the World Summit on Sustainable Development, Johannesburg 2002. It highlighted common concerns, shared principles and agreed priorities for action concerning water and sustainable development, a subject of vital importance, including regional cooperation and water priorities in Asia, to be brought to the attention of global fora on water resources.

As the momentum generated by this study was to be maintained, it was decided to undertake a series of national-level water sector policy analyses in the countries concerned. The basin studies conducted through the study were helpful in identifying some policy and institutional gaps, but were not adequate to have a firm grip on what was lacking, and what was being planned and implemented in each country (see Final Report, Volume IV). To supplement these basin-level investigations and related analyses, an attempt was made to mobilize international consultants to develop policy-analysis reports for these countries. Due to a number of constraints, only two countries could be covered in 2002: Indonesia and Sri Lanka. With some difficulty, consultancies were arranged in early 2003 for China, Philippines and Thailand. Political events in Nepal prevented the mobilization of an appropriate expert to undertake its water-sector policy analysis.

The terms of reference to the Consultant for developing a country policy report for its water sector required an analysis of the country's efforts, successes and failures in installing appropriate policies and institutions for IWRM in the country. The investigation was to review literature available both locally and internationally, with particular reference to government documents on related laws and procedures, and policy statements. The report was to identify particular conditions that enabled or inhibited the successful implementation of policy intentions, and also comment on the appropriateness of the chosen policies, relative to the desired objectives of IWRM. The report was also to identify strategic areas for further research and policy initiatives that might be necessary to make the country's efforts towards improved IWRM more effective.

Each consultancy was for a short period of about 15 working days. For this reason, it was necessary to select an expert for each country, who was already closely aware of the country's development processes and had some field experience in the country. In addition to primary and secondary material referred to above, the consultant was expected to gather necessary information through meetings with relevant officials, professionals, and any other sources of information, that could be contacted.

This volume, in its chapter 2 and related annexes, presents the information about study efforts in promoting water-sector reforms in the selected Asian countries by way of holding consultation meetings and dialogues with stakeholder groups. Chapter 3 gives a brief synthesis of information on reform efforts as reported by the five experts, and Appendixes I, II and III of this volume present their individual case study reports.

Chapter 2

Study Efforts to Promote Water-Sector Reforms

National Dialogues

Throughout the study period, a number of dialogues were held with groups of stakeholders in each country. These dialogic sessions helped in explaining study objectives to stakeholders, in assimilating information about the study context, and also in obtaining stakeholder participation in the study process. In addition, at least one preliminary workshop was held in each country to discuss the first year of study results. With the completion of diagnostic studies, five of the six participating countries (including Thailand, which joined the study in August 2001) held their final national-level workshops to share the results of field studies with the key players in the water sector. The study team in China could not hold this final workshop. The more important objective of these national workshops was to obtain the involvement of national partners in formulating and implementing new policies and institutional strategies for IWRM.

Highlights of the progress of these national efforts are outlined below.

SRI LANKA

Based on research completed by the year 2000, preliminary proposals for institutional changes were developed at the end of 2001, through intensive consultation with five hierarchical levels of stakeholders: Agrarian Development Centers; Divisional Agriculture Committees; District Agriculture Committees; Provincial Councils; and Central Coordination Committee of the Ministry of Water Resources.

The first national workshop in Sri Lanka¹ was held at the Irrigation Training Institute in Galigamuwa during 20-21 September 2000. To make the participants from the five hierarchical levels appreciate the problems prevailing in the basin, a field visit was conducted on the first day to see several important locations in the basin. While this arrangement was of great value in making the workshop a success, another feature of this event was equally useful. The participants at the workshop represented different water use agencies, different disciplines and different levels of the hierarchy of the government bureaucracy such as the national, provincial, basin and divisional-secretary levels. This varied representation provided the opportunity for the participants to understand and analyze the water resources management problems at basin level from different perspectives.

The field visit provided the participants with the opportunity to consider problems in a basin context and not in isolation or based on a sectoral perspective.

The locations visited started with Boo Ela and Van Ela at the head end of a tributary of the Deduru Oya basin, which showed the effects of water pollution. Both these canals are natural

¹Some details of this initial event are given here to set out the national efforts in the Sri Lankan case, as it represents the most mature and successful study effort in initiating some action for reforms.

storm water drainage canals, running across Kurunegala town, a major urban area of the basin. The polluted water from these canals enters the river system. It runs through the driest part of the basin where groundwater level lies far deep. Due to various activities associated with urbanization, water flowing in these canals is highly polluted. For example, all the wastewater and other solid waste material of the Kurunegala General Hospital are released into the stream. The water in the wells located close-by is polluted. The most critical issue associated with this tributary is its water pollution. It is not possible to tap this tributary to augment the domestic water supply scheme in this water-scarce area of the basin. The people in Wariyapola District Secretariat (DS) division and other adjacent divisions can be supplied with water for domestic use if the quality of water in this tributary is at acceptable levels. The National Water Supply and Drainage Board is now looking for tapping water from the Magalla reservoir (irrigation system located in the basin) for domestic water. This will lead to conflicts among domestic water users, the irrigation water users and related agencies.

Another site visited was a pumping station for domestic water supply scheme at Nikaweratiya, which also showed excessive sand mining in the river. Most of the year, a long stretch of the river below Ridibendi Ela diversion has little or no water in it. In this period, the riverbed is used for excessive sand mining. The Geological and Mines Bureau issues permits for mining, but many people are engaged in sand mining without permits. Many of them are politically influential people and they employ underemployed people in the area for this activity. The riverbed has been deepened and the river has been widened due to this reason. The communities complain that the groundwater level has dropped for this reason. Lack of effective and clear rules and regulations in managing common property natural resources is the main issue raised by many participants. There are no institutions directly responsible for managing the common resources like river reservation and its bed or its water.

After visiting the six different locations in the basin, including the Ridibendi Ela irrigation system, the participants arrived at the following main conclusions at a wrap-up session:

- Pollution of surface water in some places is a serious problem.
- Inadequacy of water for agriculture is a problem even in major river diversion systems such as the Ridibendi Ela.
- Management of the river and its environment is poor and is at risk due to undesirable development activities, mainly sand mining and brick making in the riverbed and its reservations.

Lack of clear responsibilities, problems associated with the enforcement of existing rules and regulations and lack of coordination and monitoring were significant institutional issues raised by the participants with regard to poor management of common resources in the river basin.

The workshop on the second day brought out the following:

- The water accounting indicates that the Deduru Oya is facing temporal and spatial water-scarcity problems although the flow measurement structure installed at the extreme tail end of the river records a large quantity of water flowing out of the basin (due to backwater effect of the Chilaw lagoon, a high level of water flow is indicated at the last measuring point). However, a long stretch of the river is nearly dry for about 6-7 months of the year.

- Although the population growth is not so high, the number of persons who need water for various activities is remarkably increasing.
- The cropping intensity in small tank systems is rather low. Water scarcity is one reason. The poor practice of water management and agriculture also contributes to low cropping intensity and low yield. This and many other economic factors such as marketing have made agriculture under small tanks less profitable.
- The coconut cultivation occupies about 60 percent of the cultivable land in the basin. It helps at least to keep the community at subsistence level. However, unrestricted felling of coconut trees for timber and fragmentation of coconut lands has imposed a serious threat to coconut cultivation.
- The industrial sector has not yet become a significant water consumer in the basin. Coconut-based industries dominate the existing industrial sector. The second largest industrial activity is rice processing, mainly rice milling. But under the government industrial promotion programs there may be plans to establish industries in the basin and there will be demands for water from this sector too in the near future.
- Two main town centers, Kurunegala and Chilaw, are located, one at the head and the other at the tail of the basin. In addition, there are about 22 middle-level town centers scattered over the basin. The main problem of all these centers is lack of a proper system for wastewater and solid waste disposal, causing surface water and groundwater pollution in urban areas of the basin.
- Socioeconomic data are further indicative of a close relationship between nonavailability of water for economic activities and poverty. Pockets of poverty are mainly in the water-scarce areas in the basin.
- The cropping intensity and yield in major irrigation systems (4 systems) are satisfactory, when compared with the small systems. However, they are low as an average for major systems except in one system, Batalagoda; the cropping intensity in the other 3 major systems is less than 1.8. In some small tank systems, cropping intensity is low even in *maha* (wet) season due to water scarcity. Almost all the tanks have been severely silted up and their water-holding capacity reduced.
- There are large numbers of water-sector institutions with responsibilities for water resources development and management for sectoral activities like irrigation, domestic use and electricity. However, there is no single institution with authority to allocate water among these different competing sectors. This has already led to problems such as conflicts over water. When new sectors like the industrial sector come into operation, this situation will be beyond the management of the sectoral organizations.
- Lack of coordination among agencies for water resources management is also a serious problem. The existing coordination bodies lack authority, resources and management capacity to plan and implement agricultural programs or water resources management activities effectively.

- In certain cases, there are no responsible institutions for management of some community resources like rivers and river and stream reservations.
- There are rules and regulations to address environmental-related problems in the basin but they are not properly enforced due to internal problems in the institutions and external influences.
- Many issues highlighted demands for an institution with overall responsibility for allocating and managing water in a river-basin context.
- There are significant numbers of water users, both formal and informal, in the basin. However, information regarding informal water users is not available with the existing water resources management agencies.
- There are no rules or regulations over groundwater extraction. There is no responsible organization with authority over groundwater use and utilization and monitoring.
- Though there are institutions like local government bodies, Provincial and Central Government level Environmental Authorities to control water pollution in their respective areas, this does not happen. It appears that sectoral organizations cannot address these problems effectively. There is a need for an institutional mechanism to look into these problems in an integrated manner in a river-basin context.

Based on the issues presented by the study team, and the subsequent discussions held, the following were identified as the most significant issues related to the management of water resources in the Deduru Oya river basin.

1. Inadequacy of water in the basin and lack of access to water resources.
2. Deterioration of water resources (both groundwater and surface water) and other natural resources like land and vegetation due to environmental and management problems.
3. Low productivity of agriculture.

The participants were formed into groups for detailed discussions of these three issues. After a lively discussion (details were distributed later), the participants concluded that the integrated approach alone was insufficient to address the existing problems, but it is the most critical requirement to address many water-resources-related problems. All the participants agreed that the following reforms are required to address this issue:

- Establishment of a single organization responsible and accountable for sustainable use and management of the natural resources in the basin.
- Importance of the functions such as basin-level planning, monitoring and allocation of water resources in the future.
- Need for a well-planned program to address the problems related to low productivity of agriculture.

The second national workshop in Sri Lanka was held at the office of the Chief Secretary (NWP), Kurunegala, on 27 March 2001. Commencing the discussion, the Chief Secretary (NWP) said that the Deduru Oya River Basin Management Study was a very important program in view of the prevailing confusion and lack of coordination among different agencies related to water resources, who were working separately within their own boundaries without collaborating with others, resulting in poor management and waste of these resources. Therefore, a broad integrated river basin management (IRBM) program for the Deduru Oya river basin was a timely requirement.

The discussions surfaced that the main problems in the Deduru Oya basin were the following:

- Wastewater discharge to Deduru Oya branches from Kurunegala and other small townships.
- Sand mining and excess water abstraction.
- Development in the river reservation.
- Unregulated agro-well development.
- Lack of a clear mandate for existing institutions for natural resources management.
- Lack of a proper system for information collection and management.
- Lack of capacity in existing coordinating bodies for natural resources management.
- Lack of a mechanism to establish effective communication and cooperation among different committees established by the government.
- Lack of an effective program for improving productivity.

The Chief Secretary expressing his views said that before preparing and implementing such a river-basin management plan a clear distinction is necessary whether it is to be implemented under the provincial government or under the central government. Also, it should be clear whether the present laws and regulations under the Provincial Council Act would allow such involvement of the provincial government. Under the Act, the river basins are coming under the central government if they are interprovincial.

The Chief Secretary further said that it is necessary to ascertain whether resources are available to implement such a program. He asked whether it is implemented as a funded program and if so, what the funding agency is. He said this information was necessary for him to properly brief the political authorities.

The Secretary of the Water Resources Secretariat (WRS) said that under the Water Resources Management program two river basin management projects were to be implemented, funded by the Asian Development Bank. The Deduru Oya river basin was selected as one of them. Therefore, necessary resources would be available to implement such a program.

The Chief Secretary asserted that there was no argument on the need for river basin management, but without having relevant laws in the Act this program could not be continued. Anyway, there may be a possibility of implementing it by passing some regulations. However, one participant pointed out that it is not possible to pass such regulations. The Director of the Provincial Environmental Authority said that according to the details provided this program

comprises both short- and long-term activities. The short-term activities are aimed at agricultural development while the long-term activities are aimed at natural resources management. The Environmental Authority can involve itself in natural resources management problems, such as in seawater intrusion into the Deduru Oya without such a new legal framework. The problem of the legality of a Deduru Oya RBO still remained. IWMI undertook to explore the existing legal provisions and provide a report to clarify the present situation (the consultancy report on this aspect is given in annex 1).

A significant step in the action initiation phase was the third and final national workshop in Sri Lanka held at the Culture Club in Kandalama, Dambulla during 13–14 March, 2002. By then, most of the participants as individuals were well aware of the nature of the study conducted including the institutional-related problems of water resources management and also the nature of changes required on current institutions. Therefore, they could contribute significantly to the workshop discussions. Significantly, the three Secretaries of the Ministries in charge of irrigation and water resources management participated in these discussions. (The proceedings of this final workshop are given in annex 2).

After the final national workshop, the study team visited the field to observe the changes initiated by different hierarchical committees on changing their roles on interventions on water resources management in the Deduru Oya basin. One observation was that the management of water resources had become a significant agenda item in the committee meetings. In the changed agenda, the members would do in-depth discussions on the deterioration of water quality, groundwater and watersheds.

The phase of action initiation should have been more productive if an active involvement of the Interim National Water Resources Authority (I-NWRA) could be mobilized. During this period, the WRS was undergoing a management change. However, a regular feedback was provided to WRS through written documents on what was happening in the pilot basin, and Deduru Oya was selected for testing their proposed institutional changes by the NWRA.

Following up on the national workshop held in Kandalama (13-14 March 2002), the I-NWRA held another special seminar in Kandy on 17 May 2002 (minutes of this I-NWRA seminar are given in annex 3).

With this strong foundation, the I-NWRA is expected to facilitate, through a collaborative approach with partner agencies in the Deduru Oya basin, the preparation and implementation of water resources management plans for the Deduru Oya basin. The work to be done by I-NWRA and the consultants to be appointed under Water Resources Management Project in cooperation with all concerned parties will entail practical solutions to water resources issues, such as development, conservation, protection, restoration and control.

INDONESIA

Two initial dialogues were conducted on the National Water Management Policy Reform and its implications for improvement of water management in West Sumatra. The first series of discussions were held in 2000, along with a discussion of study results to an audience of staff from national- and provincial-level agencies. The second series of discussions were held in June 2001, along with initial discussions on the implementation of ADB-supported Northern Sumatra Irrigation and Agriculture Development Project.

The major activity was the final national workshop held in Bukuttinggi, Padang, Indonesia, during 4-8 May 2002.

Considering the new water policy enacted by the Government of Indonesia, shifting the emphasis of water management from a sectoral approach towards an integrated approach, the national workshop focused on related issues, including the need to promote river-basin management. As the policy is newly implemented, with the establishment of pilot-level river basin organizations (RBOs), there is a need to discuss and share the experiences and constraints, and draw lessons for its improvement in future implementation. In this context, the need to hold a national policy dialogue on effective institutions for IRBM was commonly appreciated.

The objectives of the dialogue were the following:

1. To present an analysis of Indonesian national policies and laws on IWRM.
2. To present a program of actions taken so far and develop a plan for future action.
3. To discuss key issues related to policy implementation which cover three topics:
 - a. Trans-boundary conflicts in river water allocation, and establishing and operating river basin management mechanisms.
 - b. Financing of organizational mechanisms for IRBM.
 - c. Interaction between various laws related to water resources management.

The conference was attended by over 60 participants, consisting of international participants, national participants, provincial participants, NGO staff and staff of research institutions/universities.

The overall agenda of the seminar consisted of a field visit to Singkarak, plenary presentations of key papers and group discussions. The key papers were:

- Water Sector Adjustment Policy in Indonesia (Bappenas/DG WRM-Ministry of Settlement and Regional Infrastructure).
- Initiating the Improvement of River Basin Management: The Case of Ombilin River Subbasin (The Center for Irrigation, Land and Water Resources, and Development Studies of Andalas University).
- Strategies and Financing Aspect of Developing Effective Institutions for IRBM: Analysis and Lessons from the Feasibility Study of Bengawan Solo, Jratun Seluna, Serayu Bogowonto and Jeneberang (Tri Mulat Sunaryo and Tjuk Waluyo).
- Issues of Regional Autonomy and Trans-boundary Water Allocation in IRBM: The Case of Jasa Tirta II/Jatiluhur (Sri Hernowo and Tukul Santoso).
- Developing Effective Institutions for IRBM: The Brantas Experience.
- Developing Effective Institutions for IRBM: The Thailand Initiative.

The workshop considered the draft Provincial Regulations prepared by the study team in consultation with Padang authorities. Although Indonesia has formulated a good legal framework

for IWRM at the national level, not much was achieved in terms of implementation procedures at the local level. The draft document prepared in consultation with Padang authorities meets this need, and after discussions at the workshop, it can be a good model for other Provinces as well.

PHILIPPINES

One of the initial actions by the study team in Philippines was to prepare for organizing a core group that will orchestrate the planning, implementation and evaluation of water resources management programs for the Upper Pampanga River Basin (UPRB). In order to achieve this, a proposal (see annex 4) detailing the justifications for the need to form the UPRB Coordinating Council was prepared and presented to the various stakeholders of the basin.

Heads of the different agencies/organizations including the Local Government Unit (LGU) and representatives of interested groups within the basin were invited to join as members of the Council. The research team volunteered to serve as the ad hoc secretariat for the Council and agreed to be responsible for the monitoring, documentation and evaluation of all activities during the first year of its operation. Once established, the UPRB Coordinating Council was to identify activities and programs that would a) improve the irrigation system performance; b) improve the temporal and spatial availability of water; c) strengthen and rationalize measurement, gathering and recording of the hydrological and socioeconomic data for water resources planning and management; d) monitor and evaluate the quality of surface water and groundwater; and e) improve the utilization of water.

The study team held another series of stakeholder meetings. The main highlight of this effort is the initiative taken by the local authorities to establish the Upper Pampanga River Basin Coordinating Council (UPRB CC). Consequent to the position paper prepared by the study team, which was widely shared among the stakeholder groups, considerable interest was generated among the stakeholders, and their comments were received regarding the need and the method of establishing a CC to coordinate various water uses in the basin. The final version of the paper, which was prepared after incorporating various suggestions and comments, was presented at a meeting of all stakeholders chaired by the Governor of the Nueva Ecija Province. The main feature of these efforts is the formalism in the form of an agreement reached by the stakeholders; a document titled "Declaration of Commitment" was signed by seventeen key persons representing various stakeholder interests, including the Governor himself, and five Mayors in the basin area. The final national workshop in Philippines was held during 17-18 April 2002, at which the UPRBCC was formalized. An Administrative Order by the Governor was also signed, as it was felt by some of the stakeholders that there was no proper legal basis for an RBO. At this meeting, a Working Group (Executive Committee for the UPRBCC) was also identified by the stakeholders.

NEPAL

The study team focused primarily on establishing linkages with key government agencies to gain a feedback on the proposed set of action plans and to explore possibilities for initiating action on some components. A good working relationship was established with the Water and Energy Commission (WECS) functioning under the Ministry of Water Resources and the Department of Irrigation. There were concerns about initiating action in the East Rapti basin due to the growing security concerns in the area. However, in order to establish the groundwork for the action phase a Policy Dialogue on the subject of IWRM in a river basin context was organized. Senior

government officials, representatives of NGOs and leaders of FOs attended the meeting. This event was also considered the final national workshop by the Nepal study team (proceedings are reproduced in annex 5).

A significant feature of the workshop was that the findings of the East Rapti basin study were compared with the findings from the Indrawati case study conducted by Ministry of Water Resource. The results from the two basin studies provided a good empirical base to formulate institutional options for the management of water resources in river basins.

THAILAND

As mentioned earlier, Thailand joined as the sixth country in this study, and started an appraisal of two river basins: Mae Klong and Bangkapon. A national workshop was held in May 2002, involving a large number of interested professionals and policymakers, including senior officials of the Ministry of Agriculture and ONWRC.

IWMI's multi-country study on water management institutions in a river-basin context, supported by ADB's RETA 5812, was able to mobilize considerable interest among policy-level persons in Thailand. This interest was demonstrated specially through the Ministerial Roundtable Conference on Water Sector Challenges, Policy and Institutional Development held in Bangkok during 23-24 May 2002, in which the Royal Thai Government participated at a very high level. The meeting was able to generate a joint statement by the participating countries, which was also a mark of national interest at policy level in each of the participating countries.

Regional Workshops

Inception Workshop (26-29 July 1999, Colombo)

As a preliminary step towards promoting collaborative relationships with the selected participating countries, IWMI staff visited these countries and had discussions with local partners (see annex 6). Deliberations between IWMI and the country-based research teams led to agreed work plans for the five countries. Based on this initial work, IWMI submitted a draft Inception Report and Work Plan to the Bank on 31 March 1999. Incorporating additional information obtained from collaborating partners, and responding to the Bank's comments and suggestions, IWMI prepared the final version of the Inception Report dated 15 June 1999, which was shared with all study partners. This document was the basis for discussions on collaborative activities at the first regional workshop (Inception Workshop), which was held at IWMI headquarters, Colombo, during 26-29 July 1999. Two representatives from each of the five participating countries (one representing the researchers and the other from the implementing agency) attended the workshop.

Regional Workshop in Malang (15-19 January 2001)

The second regional workshop titled, "Integrated Water Resources Management in a River Basin Context: Institutional Strategies for Improving Agricultural Water Management," was organized in collaboration with the Washington-based International Food Policy Research Institute (IFPRI) and the Jasa Tirta I Public Corporation of Indonesia, and was held in Malang, East Java, Indonesia, during 15-19 January 2001. The ADB sponsored the event.

Interestingly, the holding of this workshop coincided with the ADB's new Water Policy being approved by its Board of Directors. The Water Policy, to which IWMI's study is closely related, had been developed after a long process of consultation.

The presence of two ADB officials and the DG of IWMI, and the participation of the Hon. Minister in charge of Water Resources Management of Indonesia underlined the success of the workshop. Over 75 participants from eleven different countries arrived in Malang, East Java, Indonesia on Sunday, January 14, 2001. The collaboration with IFPRI, and Jasa Tirta I (which was chosen on the basis of its long experience in effectively managing the Brantas river basin), provided a broad spectrum of water-related issues for discussion. The presence of key planners and researchers from Cambodia, China, Indonesia, Laos, Nepal, Philippines, Sri Lanka, Thailand and Vietnam helped in a wide dissemination of IWRM concepts and contextual needs of Asian countries for water-sector reforms. A summary report of the workshop proceedings is given in annex 7. The proceedings have also been separately published (IWMI 2001).

Regional Workshop in Bangkok (21-22 May 2002, Bangkok)

The final regional seminar on institutional arrangements for river-basin management was also organized by IWMI in collaboration with IFPRI and the Kasetsart University, and was held in Bangkok, Thailand during 21–22 May 2002. The seminar marked the culmination of the three-and-half-year research project on Developing Effective Water Management Institutions. The seminar discussed the results of studies conducted by IWMI and IFPRI in the selected river basins, which shared some common goals, and encompassed work plans and methodologies that were complementary and mutually supportive. Six papers were presented, four on IWMI's research studies and two reporting the results of the IFPRI studies. Proceedings of the ministerial dialogue are published in a separate volume for distribution among all the concerned groups in the participating countries.

Other Promotional Efforts

Ministerial Roundtable Dialogue (22-23 May 2002, Bangkok)

The event was jointly sponsored by ADB, ESCAP and IWMI, and was held in ESCAP premises. Ministers, along with two high-level officials from each of eleven countries, were invited. The invitees were from China, Indonesia, Nepal, Philippines, Sri Lanka and Thailand, where the regional study by IWMI had been conducted in selected river basins; and five other countries in the region: Cambodia, Laos, Myanmar, Malaysia and Vietnam. The meeting was able to generate a joint statement (annex 8) by the participating countries. A separate IWMI publication gives more details of the proceedings.

River Basin Management Network

As an outcome of the Ministerial Roundtable Dialogue held in May 2002, the suggestion emerged that this study should promote the establishment of a River Basin Management Network. The proposal for this purpose was sent to ADB in August 2002. Already, the GWP country partnership

in Sri Lanka has proceeded to plan such a network. Since they have not been able to launch the network as planned, IWMI would seek an opportunity to proceed with the proposal.

The salient points of this proposal are given below.

“The idea was also mooted by the representatives of the participating countries at the final Regional Workshop held in May 2002 in Bangkok, requesting IWMI to explore a mechanism by which they could advance their interest and involvement in the subject of integrated water resources management in a river basin context beyond the end of this RETA activity.

Objectives of the Network are:

1. Information Sharing—to increase awareness and understanding among members of the Network regarding RBM and its key elements, including allocation of water among various users in the basin, monitoring further basin development and ensuring environmental protection, appropriate basin organizations and their management functions, and conflict avoidance and resolution.
2. Capacity Building—to upgrade the capabilities of Network members on concepts, management skills and evaluation techniques related to RBM.
3. Advocacy—for the members to promote RBM in their regions and countries based on demand for such interventions, using emerging new knowledge and skills.
4. Dissemination of New Knowledge—to publish and widely share through devices, such as web and e-mail, the knowledge generated through research by Network members on the broad subject of RBM and its application.

The substance of the Network will be on river basin management, rather than on RBOs. During the study, it was felt that the promotion of the idea of integrated water resources management in a river basin context, and particularly (as some members preferred to term), “IRBM,” would be of greater value at the initial stage. RBO is considered as one key element of RBM, but the need exists to recognize the possibility of various forms of institutional arrangements to foster river basin management.

Initially, the Network will start with the collaborating partners of the RETA 5812, including ADB and IWMI, as the core group of members. Depending on the enthusiasm that can be generated in the short run, the Network will be expanded to include other partners and countries and agencies.

Many attempts at establishing Networks have stopped functioning with the drying up of initial resources. It is proposed that each member contributes on a regular basis to the maintenance of the Network. Other fund-raising mechanisms will have to be explored. IWMI will function as the clearing house and the manager of the web presentation will also contribute to the Network as a leading member.

Concluding Remarks

Throughout the study, most of the collaborating partners felt that any form of actual actions in policy development and implementation through a study of this nature could be very limited in many developing countries. Despite this setback, they moved forward to use the momentum generated by this study in terms of policy awareness and substantial participation of many actors in the water sector.

Chapter 3

Policy Analyses on Five Countries

In this chapter an attempt is made to identify the main features of the general picture which emerges out of the five country reports on China, Indonesia, Philippines, Sri Lanka and Thailand. The tabular presentation, shown at the end of this chapter, indicates the main elements of policy initiatives taken by each participating country. The full reports on the five policy case studies are in Appendixes I, II and III of this Volume (V) of the Final Report.

As might be expected, the problems in the water situation that the five countries are faced with are very similar. Growing water shortages under increasing population pressure exacerbated by advancing urbanization and increasing industrialization, emerging competition among different water uses, progressive degradation of water quality and unabated environmental damage in catchment areas are common problems. All countries suffer from periodic floods and droughts.

All countries have been sensitized, to different degrees, to the need for a holistic approach to matters connected with water. In addition to local situational compulsions, it is quite apparent that the new global awareness on sustainable growth, reaching a peak with the Rio Earth Summit, has affected all these countries. Donor agencies also have played a crucial role. Some countries, as the summary reports show, needed (and perhaps will continue to need) more persuasion than others. Some have embraced IWRM with open arms. Others are still struggling to do so.

The concept of state ownership of water which China and the Philippines have adopted unequivocally would no doubt have eased conceptual problems in regard to state intervention in water-resources matters in these countries. Sri Lanka's policy declaration also embraces the concept of state ownership of water.

There appears to be some consensus on the following elements of policy (whether put into practice yet or not):

- River basin to be the unit of planning and management (although prescription does not seem to have been yet convincingly translated to practice).
- The need for some high-powered apex body for policy coordination and monitoring of implementation (almost all are beset at present with a multiplicity of agencies with overlapping and/or conflicting jurisdiction, with the apex body in several cases yet apparently a distant dream).
- Introduction of participatory management at the lower end of the service provision spectrum (secondary or tertiary segments of irrigation schemes to be managed by farmer organizations [FOs] and some small rural water supply schemes to be managed by community based organizations).
- Bringing in the private sector for the sake of anticipated operational efficiency and perhaps more importantly as a means of bridging the investment resources and O&M funding gaps. Various incentives are on offer. Except for some schemes in the Philippines (including the supply system for Metro Manila) the reports do not highlight any private-sector schemes in operation.

- **Water Allocations and Water Rights/Entitlements**—The principle appears to be universally accepted, but some countries seem to hesitate to introduce the regime. The justification for allocation is that water as a scarce resource must be equitably distributed among competing uses in a way that will maximize the public good. An institutionalized allocative mechanism is necessary as market forces will not come into play on account of the nature of the ownership of water as a commodity.
- **Water charges and cost recovery**—The need for charging an economic price for raw water and the need for cost recovery in the case of all uses, is universally accepted (subject to various caveats) but some countries do not seem to have made up their minds yet regarding implementation because of the political sensitivity of the issue. Regarding irrigation water, a compromise attempted in some countries is to let minor schemes and/or the secondary/tertiary segments of major schemes to be managed by FOs, which will appropriate an irrigation fee and utilize it for O&M. It has been suggested that the possibility of using voluntary labor for such work in countries with such a tradition in regard to community projects might facilitate such an arrangement.
- Further, in regard to irrigation water and domestic water supplies to less affluent communities (rural as well as urban), some countries recognize a need for refraining from recovering full cost. In the Philippines, the accepted policy is to charge full cost (depreciation as well as O&M) in urban areas while in urban low income communities as well as rural areas it is partial recovery of O&M with cross subsidization. Some policy regimes specifically require the “capacity to pay” consideration to be taken into account. Universally, the predominant attitude is, without doubt, that the peasant and the low-income city dweller are entitled to special treatment in the matter of cost recovery. In the case of the peasant, the social consideration is buttressed by the socioeconomic concern of not jeopardizing food security by unwelcome intervention in traditional practice.
- Almost every country (other than those yet without the necessary legal provision) has adopted “the polluter pays” principle and levies effluent charges. At the same time, financial incentives are offered for introducing effluent-abatement facilities.

Where reforms have had a smooth passage, political will has played a crucial role. Conversely, some countries have had to face the apathy and have barely concealed hostility of higher echelons of the administrative hierarchy, who fear the loss of power and rent seeking opportunities implicit in some reform measures.

Table 1. Key features of current water policy framework of five countries.

	China	Indonesia	Philippines	Sri Lanka	Thailand
Acceptance of IWRM	Along with adoption of Agenda 21 by China in 1994	With the adoption of the Reform Agenda in 1999	Formally with the adoption of the 2001-2004 Medium-Term Development Plan, but a slow process of adopting it in practice	With the adoption of National Water Policy by the Cabinet in 2000	With the adoption of National Water Vision
Enabling Legal Framework	Water Law of 2002, and supportive legislation for environmental protection	New Water Law awaiting parliamentary approval	Pre-1978 Water Code as amended from time to time	New Water Law awaiting parliamentary approval	Draft Water Law in gestation for several years
Other Institutional Arrangements	River Basin Management Agencies, along with subnational politico-administrative units for planning and management; and establishing supervision, monitoring and dispute resolution systems.	Reform Agenda adopted in 1999, National Water Policy; National Water Council as apex body for policy coordination, promoting river-basin based water management systems, inclusion of non-governmental stakeholders in such systems, regional autonomy and revenue sharing framework, and incentives for private sector participation.	Promotion of river-basin based planning and management; an integrated strategy to cover all water uses and environmental concerns	National Water Policy adopted in 2000; Water Resources Council and an Interim Water Resources Authority, promoting river-basin committees and an integrated approach based on watershed/catchment management.	National Water Resources Committee established in 1987, and Office of National Water Resources Committee in 1996; National Water Vision promoting IWRM adopted in 2000; and New Thailand Water Policy approved by Cabinet in 2000, committing a Water Act, basin level planning and management systems, and involvement of NGOs in water management.
Ownership of Water Resources	State	Controlled by the State	State	State	Not specifically stated; assumed as common property
Priority in Use of Water	Domestic consumption		Drinking water		Towards giving equitable allocations to all sectors on priorities established at the basin level.
Water Rights and Pricing, and Cost Recovery	Permit system; water use fees based on volume	Allocation system; self-financing WUAs for smaller irrigation systems and a scheme of service fees for others	Water permits for “beneficial use” (legitimate needs); bulk water withdrawals through permits; full cost recovery for urban drinking water, and partial cost recovery for low-income urban and rural areas	Bulk entitlements; transferability of entitlements; O&M cost recovery for irrigation; domestic water tariff to reflect costs of O&M and debt servicing	Equitable allocations for all sectors; cost sharing with “beneficiaries”; bulk water supplies to River Basin Committees.

Legality of a River-Basin Management Organization for Deduru Oya²

Background

The study to examine the legality of an effective RBO for Deduru Oya is a follow-up of the Regional Technical Assistance Study (RETA) financed by the Asian Development Bank (ADB). It covers five river basins in five countries, namely China, Indonesia, Nepal, Philippines and Sri Lanka (ADB-RETA) for case studies. The Deduru Oya river has been selected from Sri Lanka for this study in consultation with the relevant authorities.

Phase I of the activities (problem diagnosing) in the Deduru Oya basin commenced at the end of 1999 and was completed in October 2000. All stakeholders operating at different levels (national, provincial and basin levels) were actively involved in identifying problems in the basin. The researchers attached to the IWMI conducted intensive focus group meetings with multiple water users and officials attached to different sector agencies to analyze problems relating to the management of water resources in the basin.

In parallel to the stakeholder consultation activity, several other research activities were also completed in the first phase of the study. These activities included water resources accounting, preparation of detailed river basin profiles, SWOT analyses of existing institutions in managing water resources in the basin and analysis of the socioeconomic environment. These research activities together with stakeholder consultations provided a comprehensive set of information to obtain a better understanding of the problems in the basin with regard to managing water resources.

At the end of Phase I of the study, a workshop was held with representatives of key stakeholder agencies to discuss the findings. The participants in the workshop contributed from their perspectives to understand the gravity of some problems. They even came forward to suggest remedial measures.

According to the Terms of Reference provided for this consultancy, the most critical part of the study remains to be completed in year 2001. IWMI is supposed to initiate possible actions to improve the performance of Water Resources Management Institutions. As such, this phase of the project is very important for the formulation of a water resources management policy. The Water Resources Secretariat (WRS) set up under ADB assistance has selected two river basins, the Deduru Oya and the Menik Ganga basins to pilot-test its policy proposals. Unfortunately, a delay has occurred in the WRS process and, therefore, it may be difficult to implement these two ADB-assisted projects simultaneously in the two sites.

As an entry point for the action phase of the Deduru Oya project, an initial discussion was held between the Chief Secretary to the North Western Province (NWP) and IWMI researchers. This was for a dialogue on future actions to be initiated in the basin. The meeting underscored the conviction of the NWP authorities that an effective organizational mechanism is required to manage the river and the riverine resources. They were also of the view that such an organization

²This paper was prepared by Joe Alwis, providing a short-term consultancy to IWMI.

instituted under the purview of the Provincial Council (PC) would prove to be an effective management body, which can coordinate resource management at the macro level with the service delivery management at the system level to address complex issues in the river basin. There were however certain doubts expressed about the legality of such a project due to the implications arising from the constitutional provisions appearing in the Amendment, which obligate the central government to take responsibility for any scheme associated with the use of water in an interprovincial river system. Indeed, Deduru Oya is an interprovincial river system with its source in the Central Province and running through the NWP. Thus it is subject to certain limitations imposed by the Amendment in the utilization of its resource base. The meeting therefore decided to initiate a study which will examine the legality of a river basin management organization that would be set up in the NWP to deal with the Deduru Oya basin. Accordingly, this study examined the legal status of the initiative envisioned by the NWP for a scheme or a project and the legality of any organization that would be set up by the NWP to address the specific areas of concern identified by the study group.

Constitutional Provisions Relating to the Legality of an Effective River Basin Management Organization for Deduru Oya

The Thirteenth Amendment (hereafter referred to as the Amendment) introduces a new dimension to the types of irrigation systems in the country by drawing a distinction between “irrigation schemes relating to rivers running through more than one Province or interprovincial irrigation and land development schemes” and others. The relevant provision given in Article 19 in the Ninth Schedule, List I (Provincial Council List) is as follows:

19. Irrigation—Planning, designing, implementation, supervision and maintenance of all irrigation works, other than irrigation schemes running through more than one province or interprovincial irrigation and land development schemes.

In the process of further elaborating the principal characteristics of Inter-Provincial Irrigation and Land Development Projects, Article 2 of Appendix II in the Amendment provides the following, under the caption “Land and Land Settlement:”

2. Interprovincial Irrigation and Land Development Projects

2.1 Such projects would comprise irrigation and land development schemes:

- a) within the Province initiated by the State and which utilize water from rivers following through more than one Province; a Provincial Council, however, may also initiate irrigation and land development schemes within its province utilizing water from such rivers;
- b) within the Province which utilize water through diversions from water systems from outside the Province; and

- c) all schemes where the command area falls within two or more Provinces such as the Mahaweli Development Project.

2.2 These projects will be the responsibility of the Government of Sri Lanka:

Accordingly, five types of irrigation and land development projects have been recognized by the Amendment:

1. Minor irrigation works defined in the Irrigation Ordinance (No. 32 of 1946 as amended). These are schemes which have an irrigation extent below 200 acres (80 ha). In terms of the Article 9:2 of the Amendment, “rehabilitation and maintenance of minor irrigation works” are included in the Provincial List as one of its areas of responsibility.
2. Interprovincial Irrigation and Land Development Projects within a province initiated by the state and which utilize water from rivers flowing through more than one province. (Article 2:1 (a) in Annex - I of Appendix – II).
3. Interprovincial Irrigation and Land Development Projects within the province which utilize water through diversions from water systems from outside the province. (Article 2:1 (b) in Annex - I of Appendix – II).
4. All schemes where the demarcated surface command area falls within two or more provinces such as the Mahaweli Development Project. (Article 2:1 (c) in Annex - I of Appendix – II).
5. Irrigation and land development schemes that may be initiated by a Provincial Council within its province utilizing water from such rivers which flow through more than one province.

Amongst the above categories of irrigation works, items 2, 3 and 4 come under the purview of the central government in terms of the Article 2:2 quoted above. Item 5 shown above is a special category of irrigation works identified by the Amendment under a special proviso added to Article 2:1 (a). Since the responsibility for initiating the scheme rests with the Provincial Council, perhaps using its own funds, it is best that the management responsibility also should remain with the Provincial Government. In all likelihood, the law makers in their wisdom have taken a positive step to provide an exception and enable the newly formed Provincial Governments too to initiate management improvement projects, such as river basin management, by soliciting support from the specialized central organizations to mobilize the stakeholders and address the critical issues for solutions. Otherwise, the opportunities available presently to the PCs to get involved either for creating or managing such production infrastructure in the province are few and far between. To quote the proviso given in 2:1 (a) again: A Provincial Council however, may also initiate irrigation and land development schemes within its province utilizing water from such rivers.

It is observed that in the proviso given above, the inclusion of the qualifying word “however” draws a contrast between the state and the provincial government’s responsibilities in relation to the management dimension by creating a new category of schemes that will have the following characteristics:

- a. The scheme is not initiated by the central government.
- b. The scheme can use water that flows in an interprovincial river system.
- c. The scheme will be within the province.
- d. The scheme would be a new scheme by the province and no scheme already established can be considered under this category.

Since the subject matter is included in the concurrent list, the concurrence of the government has to be obtained through consultations to initiate the project. Any doubt that may be associated with the use of the words “may initiate” could be resolved by an examination of the Sinhala version, which is considered the original version of the Amendment.

In delineating the schemes that would come under the purview of the central government, the Sinhala version uses the expression ...*samaharavita viya yutuya...* (perhaps should be) and in respect of schemes that come under the special proviso, the expression used is...*arambha karanu labiya hekiya...* (is possible to initiate). These two expressions in Sinhala carry a clear reference to a past occurrence in describing the systems already accomplished by the state and a futuristic reference for the schemes that may be initiated by the Provincial Council in the future. In other words, the determining factor would be whether the scheme was initiated by the central government or by the provincial government and any scheme by the PC amounts to a new initiative.

According to the foregoing analysis, it is established that the NWP has no legal impediment to use the Deduru Oya for a project to be implemented under the aegis of the Provincial Council. The Provincial Council, however, will be required to negotiate and discuss the issues involved with the Central Province in the first instance and also with the central government for its concurrence to initiate action.

The River Basin Management Organization (RBMO)

The principal objective to set up an effective RBMO for Deduru Oya is to facilitate water resources planning in the river which is already subject to severe stress due to a permissive access regime maintained over the years by competitive users of the river basin and the resource base.

The National Water Resources Authority (NWRA) has already indicated in the policy paper of its intention not to establish its own field-level units to implement policies and programs enunciated for the sector. It proposes to cooperate and delegate appropriate responsibilities to provincial and local authorities and also solicit support from the private sector, nongovernmental groups, and community and other local groups where such actions are feasible.

It is considered expedient for the NW Province to initiate action to establish the RBMO primarily because of the location-specific issues and problems which the organization has to attend to in dealing with a large number of stakeholder groups. A devolved administrative environment close to the site would enable the NWP to initiate an effective management system by actively mobilizing local resources. Even in dealing with land-related issues such as encroachments, NWP enjoys an advantageous position in using its devolved authority over lands more effectively.

As far as constitutional provisions relating to water resources planning in the river basin are concerned, the Amendment contains the following provisions in Article 17:1 of List II (Concurrent List).

B – List III (Concurrent List)

17. Irrigation

17.1 Water storage and management, drainage and embankment, flood protection, planning of water resources:

References made to “planning of water resources” in Article 17:1 of the Concurrent List is of direct relevance to the involvement of the NWP in planning for water resources in Deduru Oya. Since the subject of water resources planning is included in the Concurrent List, any new initiative by the province will have to be negotiated with the Central Province in the first instance. With the concurrence of the Central Province, the matter is required to be negotiated by the NWP with the government for its approval to initiate the project. In terms of the special provisions under Article 2:1 of Annex I of Appendix II, it is in order and consistent with the constitutional provisions for the government to approve or disapprove any initiative by the NWP in terms of 154 G (5) (b) of the Amendment to set up a river basin management organization for Deduru Oya and initiate a program for planning of water resources in the river system within the NWP. As a matter of fact, NWP has already established a Provincial Environment Authority for a subject included in the Concurrent List for the “Protection of the Environment” (Article 33). The modus operandi would be almost the same in respect of the present case as well.

It is desirable that the proposed activities to institute a River Basin Management Organization should be undertaken in a learning process through a proper monitoring and evaluation of each step that would be taken to establish the institutional framework. In this regard, the valuable experiences learnt from the pilot phase of the work carried out by IWMI would be immensely helpful in identifying the appropriate local organizations that would provide the base for the development of local-level institutional support through stakeholders. Lessons from this project would be useful in guiding the future work in similar RBOs.

Deduru Oya originates and passes through the Central Province for a relatively short distance. In that context, it is observed that the NWP has a greater stake through riparian rights which it has hitherto enjoyed in the use of riverine resources in Deduru Oya. However, it is considered essential to treat the Central Province as a legal party to any plan or agreement dealing with the development of Deduru Oya. Any future plans for watershed development in Deduru Oya would call for closer links with Central Province authorities for collaboration. In the circumstances, it would be necessary to establish a coordinating mechanism to reach a negotiated understanding on the nature of planning which the Central Province would envisage for the development of the Deduru Oya river basin. In any event, prior concurrence and exchange of letters with the Central Province would be essential before any application is made to the government to set up a River Basin Management Organization to implement a water resource plan for Deduru Oya by the NW Province.

Conclusion

It would be clear from the foregoing analysis of the relevant provisions of the Amendment and other related facts presented that no legal impediments would stand in the way of the NWP

authorities to present a request to the government for approval to proceed with the setting up of a River Basin Management Organization for Deduru Oya as envisioned by the Provincial Council.

Reference Material

Provincial Council System

Sri Lanka has a unitary constitution. Steps to devolve powers to Provincial Councils (PCs) were effected by the Thirteenth Amendment to the Constitution (hereafter referred to as Amendment), which established the legislative and executive powers at the provincial level. Provisions for the functioning of the devolved system were made by enacting the Provincial Council Act No. 42 of 1987 and the Provincial Council (Consequential Provisions) Act No. 12 of 1989. The scope of devolution covers both executive and legislative powers within the provinces. Judicial reviews of statutes in the PCs are provided by the establishment of Provincial High Courts.

PC members are elected for a term of 5 years through the proportional representation system (as opposed to the “first past-the post principle”). A governor appointed for each province by the President for a 5-year term is vested with executive powers which he can exercise by himself, through the Board of Ministers and through officers subordinate to him. Under special circumstances the President is empowered to assume all or any of the functions in the administration of the Province or declare that the power of the PC should be exercised by or under the authority of the President.

Since the establishment of the Provincial Council System amounts to a major restructuring of the country’s administration, the devolution of powers to the subnational units needs to be defined in relation to the powers enjoyed by the center. It is therefore necessary for the powers and the form of the PC to be defined by the center. PCs do not have powers independent of the government. This makes it necessary for any amendment or a proposal to repeal the Amendment to be effected only after reference to all PCs and if all agree it is passed with a single majority and if one or more PCs disagree, a two-thirds majority vote is required in the Parliament.

In order to define the power-sharing arrangement between the center and the province, three lists called the Provincial Council List (List I), the Reserved List (List II) and the Concurrent List (List III) are shown under the Ninth Schedule to the Amendment. Accordingly, devolved subjects constitute those that are included in the Provincial Council List. Responsibility for subjects shown in the Concurrent List has to be shared with the government by the PC.

The legislative powers of the PCs are subject to certain terms and conditions. PCs can initiate statutes in the PCs for subjects included in Provincial Council List within the framework of the national policy. In this regard, the national policy has to be laid down by the government. For subjects shown in the Concurrent List, consultation with the Parliament is necessary; and where a law is already passed, it is subject to Parliament’s power to decide the contrary by resolutions.

When the Parliament passes laws, the President will refer such Bills to all PCs and if all PCs concur, the Bill is passed by a simple majority; where one or more PCs disagree, the Bill can be passed only by a two-thirds majority. One or more PCs also can request by resolution to make laws on any matter set out in the PC List.

The Board of Ministers formulates programs for subjects given in the Provincial Council List in conformity with national policies relating to such subjects. In doing so, the PCs function as self-regulating bodies making their own rules to regulate its procedures and conduct their business.

Procedures so formulated in a PC cannot be called into question in a court of law. For instance, a PC can have a rule which stipulates a time period within which a matter referred to the Parliament for consultation should be responded. At the end of the period, the matter is deemed to be approved, if no reply is received.

The Amendment also has set up a Provincial Fund and an independent Provincial Public Service Commission under the law which enable the PC to decide on the use of its funds and deploy staff to carry out its work. All taxes imposed by the PC, grants from the Consolidated Fund, loans advanced by the government and all other receipt are credited to the Fund. Most of the staff required is drawn from the Public Service in the center. The provisions however, recognize certain staff, such as the District Secretary (Government Agent), Divisional Secretary (Assistant Government Agent) and the Grama Niladhari who work in the province, as not included in the Provincial Public Service and belong to the center.

Legal provisions also delineate powers to make statutes applicable to the Provincial Council List I. When the central government prepares a bill in respect of the subjects in List I, the President is required to refer the bill to other PCs for them to express their views in terms of Section 154 G(3) of the Amendment. When every PC agrees, it is passed in the Parliament by a majority vote. Where one or more PCs disagree, it has to be passed by a two-thirds majority. In such situations, the provisions of the bill will apply only to PCs agreeing to the bill.

Provisions are also available under Section 154 G(4) for one or more Provincial Councils to request Parliament to make laws on any matter set out in List I. Upon passing the bill by a majority vote, the provisions will apply only to PCs requesting for adoption of the bill.

PCs are empowered to make statutes in respect of subjects included in the Concurrent List III after consultation with the Parliament.

PCs have no power to make any statutes on matters set out in the Reserved List II.

Draft Water Resources Authority Act

A wide range of organizations are involved in the use and management of water resources in Sri Lanka. As such, institutional reforms in Sri Lanka's water resources sector in the past have been a daunting challenge. Beginning in 1964 and with the enactment of the Water Resources Board Act, efforts have been made to formulate national water policies and integrated water resources planning. But these attempts petered out to start other activities ending in hydrogeological investigations and groundwater development through tube wells. Again in 1980, the Ministry of Lands and Land Development prepared a Water Resources Act aimed at making water resources allocation among various sectors and establish a Water Resources Council as an Advisory Body. But the Act encountered political hostilities and did not proceed beyond the Cabinet level. The present initiative began during 1993-94 with financial support provided by the ADB and USAID to carry out an assessment of water resources in Sri Lanka and formulate proposals for institutional strengthening and capacity building in the area of water management. Consequent on these initiatives, a Strategic Framework and an Action Plan for Comprehensive Water Resources Management (ISCWRM) were prepared and the government approval for the proposals was given in 1995.

Institutional Structure

An important feature spelt out in the policy statement prepared for the purpose is that the planning and management of water resources and related activities will be carried out by a set of national-level apex agencies that are independent from agencies that are presently designated to carry out specific responsibilities in the water-use sectors. The three national bodies are:

1. National Water Resources Authority (NWRA) for policy formulation and policy management.
2. Water Resources Council (WRC), which will have coordination and advisory functions.
3. Water Resources Tribunal which will provide arbitration for conflict resolution in water-related disputes.

Institutional arrangements will also be made at the provincial and local levels for stakeholders to participate effectively in water-resources planning and implementation.

At the outset, it has to be mentioned that a structured approach has been adopted by setting up a shadow Water Resources Council which will attend to the preparatory groundwork necessary to set up the organizational structure needed for the initial phase of the project plan. A difficulty that may be encountered in this respect is the absence of similar previous experiences within or outside the sector in the past to back up the establishment of a new body as an apex organization which works independent of other agencies responsible for program implementation in the field. In this respect, a “Conceptual Governance Framework for Integrated Water Resources Management” has been presented in the document entitled “Water Vision 2025 Sri Lanka” issued by the Sri Lanka National Water Partnership (2000). This framework has effectively captured the essential organizational prerequisites of a comprehensive IWRM design in relation to the levels and functions envisioned for the water resources sector. While the Amendment has laid down the limits in the use of interprovincial rivers, the Framework has drawn attention to the imminent requirement for the setting up of interprovincial and interdistrict river basin management organizations. This approach deserves more in-depth assessment in relation to similar experiences in other developing countries in particular, which have initiated such structural changes in a sector that is steeped in traditional policies, practices and systems of management. While water is considered a precious economic input to promote social and economic development, it has enjoyed a place in the center stage for over five decades in Sri Lanka as a critical input in welfare-oriented policies and programs in the major irrigated agriculture settlements established in the country.

Related to the above issue is the designation of a neutral agency in the form of the Department of National Planning, which comes under the purview of the President as the agency responsible for Water Resources Management to oversee the preliminary work carried out in this regard. The rationale for this decision appears to have been prompted by the need to select an agency that belongs to another Ministry unrelated to the allocation and utilization of water resources in the country. However, given the sensitivity of the agenda of work envisioned in the policy statement prepared for the sector, the more important requirement needed to carry out the onerous task of steering the sector successfully through the agenda of work would be a strong and sustainable commitment to carry through the work as planned with a strong element of participation by the country as a whole. It is therefore contended that the concept of a neutral agency would not contribute in any substantial way to the attainment of objectives as much as a clear commitment

would accomplish by assigning the responsibility for water resources management to the Ministry dealing with irrigation as the largest user of water. The institutional memory of the irrigation sector available with the relevant Ministry should be harnessed for a qualitative improvement in the new plans for the irrigation sector. In order to ensure the highest level of attention, a supportive institutional mechanism such as a Cabinet Subcommittee may be considered in the formative stages of developing the framework for implementation.

Another feature that deserves close attention in the proposed policy is the decision to confine the activities of the NWRA to the center and depend entirely on field-level organizations to provide the needed assistance to implement programs in the field. For this policy to succeed, an organizational approach, which can mobilize the existing Provincial Councils and other agencies such as the Divisional Secretariats through devolved policies and decentralized strategies, may be considered for the long term instead of delegating the powers to the agencies in the field. In doing so, it would be necessary to adopt appropriate measure to strengthen the institutional capacities of the regions to handle the work effectively and undertake resource management as an integral component of the provincial and grassroots-level activities. In all likelihood, the work envisioned includes a vast array of organizational details to handle the enormous work involved in the administration of water resource allocation policies in respect of each party as envisaged by the draft legislation. These measures will also call for the deployment of large field units. The feasibility of various approaches against their effectiveness and costs needs to be examined.

National Water Resources Authority and Water Resources Council

The role of the WRC as compared to that of the NWRA appears to be less convincing and meaningful by being assigned to carry out a coordinating function in relation to inter-sectoral and interagency issues with all the relevant Secretaries of Ministries and Heads of Departments participating as members of the Council. The subservient position accorded to the WRC in the institutional hierarchy is an indication that the priority given to the work assigned to WRC is less important. Since the work component of the NWRA is biased towards areas with a high technical content, the overall policies in the water resource sector dealing with social and economic aspects as a whole to guide the implementing agencies in such areas as management, etc., would be considered as an appropriate area to be considered for the work of the WRC. Thereby the social and technical content of the water resource sector could reach the right balance and facilitate a better harmony among the work components to deal with water-related sensitive issues more effectively.

Water Resources Tribunals

In the past, the work of Tribunals appointed to deal with sector-specific issues has been less than satisfactory, except perhaps in the Labor Tribunals where the work is more oriented towards the urban centers. Three matters in relation to the appointment of Tribunals are suggested for consideration.

1. Adequacy of a 15-member cadre to cover the country's requirement to deliver the goods.
2. The appointment of nonlegal professionals to sit on judgement regarding matters which are strictly judicial in character.

3. The feasibility of a centrally operated panel serving the country in three panels and the effectiveness of other options available in similar circumstances.

River Basin Committees

The proposal to set up River Basin Committees in areas declared as Water Management areas should try to benefit by the institutional experiences available with different agencies including the NGOs that have carried out successful work in motivating and educating the stakeholders to raise their awareness levels in a bid to obtain a productive and responsive participation. The work carried out by IWMI in working with existing field-level associations of stakeholders may also provide a useful input to the formation of River Basin Committees. The need to sustain such grassroots-level involvement for resource management on a continuing basis, even outside the declared areas may be considered over the long term.

Proceedings of the Final National Workshop on Effective Institutions for Water Resources Management in the Deduru Oya River Basin (ADB-A 5812) Held at the Culture Club, Kandalama, Sri Lanka

Introduction by Mr. D. J. Bandaragoda of IWMI

The need for Integrated Water Resources Management (IWRM) was highlighted and the key issues related to the workshop were presented. There are issues emerging in many river basins due to problems related to water quality and quantity. Depletion and deterioration of water resources are reported from many river basins due to human interventions and ecological changes. There are demands from competing users like agriculture, domestic water supply, hydropower, industries, aesthetic needs and environment. Some basins have approached closure. The nonfarm sector has taken water away from irrigation and, therefore, inevitably, the irrigation sector has to become more efficient and profitable to sustain under these circumstances. Due to these reasons it is required to manage water resources in a basin in an integrated manner taking the river basin as the unit of planning and implementation for water resources development and management activities. The IWRM is concerned with achieving objectives related to three areas: sustainability, productivity and equity.

The river basin is the most appropriate geographical unit for analysis for IWRM, as it helps coordinate water allocation among the users, assists resolve conflicts and facilitates greater stakeholder participation. It further helps promote information sharing among user groups. It looks beyond the traditional sectoral view and assists in environmental protection.

The ADB RETA study has explored a typology of five river basins in the five originally selected countries and has demonstrated the contextual nature of water resources development. Currently, the ADB RETA study is being carried out in six countries: China, Indonesia, Nepal, Philippine, Sri Lanka and Thailand, selecting one river basin from each. A main feature of all these river basins was the absence of an RBO. In all study sites, linkage was possible with new national water policies and laws. An emerging interest in IWRM could be observed among stakeholders in the basins studied. Comparing the situations in different river basins, one can find that that Fuyang in China and Deduru Oya in Sri Lanka have no more water left for development activities. However, East Rapti in Nepal, Upper Pampanga in Philippines, and Ombilin in Indonesia still have utilizable water for development activities. IWRM is more needed in basins like the Deduru Oya and Fuyang.

The study framework provided for a number of essential components: assessing the resource base and institutional framework at the national level, evaluation of physical, social, political and institutional context of the river basin, development of a comprehensive river basin management plan, implementing the management plan, and monitoring and evaluation of plan implementation.

Strategies for institutional development are the identification of both basin-level conditions for water resources management and the potential for improvement in water management, and, finally, the development of relevant policy and institutional changes that need to be introduced for improved water management.

The institutional forms that are being considered in selected countries are many. They include national-level coordinating mechanisms, a comprehensive water law, basin-level coordination mechanisms, explicit water allocation rules, a basin-level monitoring setup and mechanisms for conflict management.

The achievements of the ADB-RETA include the establishment of the Upper Pampanga river basin coordination council, Padang Provincial procedures for IWRM, proposals for Deduru Oya river basin management and guidelines for national IWRM strategies.

Policy Reforms Proposed in Sri Lanka (Mr. Ariyabandu of WRS)

The purpose of the national water resources policy is to use water resources more efficiently and equitably and save the limited water for future generations. The Draft Water Resources Authority Act shows that the water resources policy includes important features such as water rights and allocation policy, water resources demand management policy, groundwater management policy, data and information management and an institutional structure for water resources management.

Water resources are considered as public-owned, and managed jointly by the government and users. Water resources are managed in a sustainable manner with the active involvement and participation of people. Another principle is water allocation through a system of entitlements. Water resources management areas will be declared by the Authority and water entitlements will be applicable to those areas only according to policy principles. There will be water conservation agreements with bulk users to maintain equity at times of water shortage. Water resources management costs will be a responsibility of the government through voluntary contribution from NGOs. The policy is gender-sensitive and recognizes the roles and need of men and women. The policy further recognizes the special role of the irrigation sector in Sri Lanka and safeguards the interests of irrigation water users balancing the interests of other sector water users. Managing water resources information through data sharing between agencies is also accepted in principle.

Water rights and allocation policy assures orderly allocation of water, equitable access to water by all users, preservation of water supply for environment and sociocultural priorities and voluntary transfer to higher uses. Policy safeguards the interest of the poor and small-scale farmers. Water rights are granted through water entitlements which have terms and conditions regarding water abstraction. Water entitlements are issued on priorities such as safeguarding the small-scale users, sociocultural priorities and environmental values and rights of the existing water users. These entitlements can be transferred with the approval of the NWRA.

The objective of the water demand management policy is to use water resources efficiently and maximize the value of the resources to the society. The policy intends to make additional water available for other priorities. The demand is managed through water entitlements, promoting water conservation, creating knowledge and awareness, regulatory controls through entitlements, promoting water-saving technologies in irrigation and water-supply sectors and through water-conservation agreements with bulk users.

The proposed groundwater policy promotes the sustainable development and management of groundwater resources in the country. This is implemented by issuing water entitlements to bulk users, encouraging registering of small wells by local government authorities in water-sensitive areas, encouraging groundwater information and management and research, groundwater quality management through regular monitoring and through public awareness on groundwater resources.

Water resources data and information policy improve quality, accessibility and efficiency of data and information management required for IWRM through data sharing and coordination, updating the water-resources data system, etc.

The proposed institutional structure for water resources management includes NWRA, WRC and WRT and River Basin Committees (RBC). The NWRA is the apex body responsible for coordination, planning, regulation and monitoring national water resources. It will not be responsible for project planning, implementation, O&M, etc. The WRC is the permanent, high-level coordinating and advisory body for national water resources management. The WRT is an independent appeal tribunal that serves water users and other parties affected by the administration of water-resources entitlements by the NWRA. The RBCs are the institutional mechanisms that provide links to provincial/district/divisional/local government and to other stakeholders at the local level in the basin concerned. River basin committees are legal bodies with clearly defined advisory roles.

Participants' Responses to Mr. Ariyabndu's Presentation

- The participants agreed that an agency like NWRA is required for implementing IWRM in the country. However, they questioned why an advisory body like WRC is required. It has no clearly defined roles and functions from their point of view. Some pointed out that its functions are beyond advising.
- Some participants pointed out that one tribunal at national level is not adequate. There need to be tribunals at different levels. It was pointed out that the Chairman of NWRA can appoint tribunals as and when required. There can be tribunals at divisional levels. The national-level tribunals can deal with larger issues.

Findings of the Deduru Oya Study (Mr. K. Jinapala of IWMI)

The main objective of the study is to analyze the institutional options available for better water resources management in the basin. The other objectives include supporting efforts of the Government of Sri Lanka for institutional development for water resources management and providing input to the Water Resources Secretariat with research information and also to make stakeholders aware of the necessity of IWRM.

Study inputs include the investigations on the characteristics of natural resources, water accounting in the basin, the socioeconomic characteristics in relation to land and water resources in the basin, performance of agriculture and analysis of current water management institutions. The outputs expected from these studies were an analysis of strengths, weaknesses, opportunities and threats for land and water resources development, analysis of water availability and water-resources-related issues, identification of problems faced and institutional gaps and making suggestions for institutional reforms.

The Deduru Oya basin, with an area of 2,622 square kilometers, comprises 15 sub-watersheds. Temporal and spatial variations in rainfall are significant in the basin with 700 mm–1,400 mm in

maha (wet season) and 500 mm–1,000 mm in *yala*. Water accounting for *yala* (dry season) shows that uncommitted outflow from the basin is 357.58 MCM.

Agriculture is the main water use sector in the basin. For this purpose, several major and medium tanks and about 2,000 small tanks have been developed. In addition 5,000 agro-wells and 2,500 river lift pumps have come into operation in recent times.

Hydrological and environmental problems in the basin are excessive sand mining in the river and its tributaries, brick and tile making in river banks, seasonal water scarcity and pollution of natural water sources due to adverse impacts of urbanization. Coastal areas of the basin have been affected due to unregulated shrimp farming activities and saltwater intrusion to the river due to sand mining. The major problem in the tank system is the seasonal water scarcity and low productivity. Groundwater resources face depletion and water quality deterioration due to unregulated agro-well development in the basin.

The proportion of the population involved in agriculture in the basin is around 40–50 percent. Other livelihood activities include private- and public-sector employment. Public-sector employment is around 7–25 percent while private-sector employment is around 10.5–22 percent. People in the basin derive a significant income from coconut cultivation and it is the main supplementary income for many paddy farmers. Pockets of poverty are observed in water-short rural villages and semiurban areas with small landholding located close to Kurunegala town and surrounding DS divisions. Paddy cultivation is the main livelihood activity of the people in this basin. Higher cropping intensities (above 0.90) are reported from major irrigation schemes in *maha* seasons while it is around 0.52–0.78 in *yala* seasons. In minor irrigation systems cropping intensity in *maha* is around 0.25–0.95. In *yala* it is around 0.23–0.65. Paddy yield is 3–4 MT in major irrigation schemes and 2–2.5 MT in minor irrigation systems. Comparatively higher yields are reported from major irrigation schemes. However, there is potential for increasing the yield in both major and minor systems through appropriate technological innovations.

In terms of the institutional system in place for water resources management, there are ministries and departments and acts and ordinances passed in the parliament at the national level. There are district-level branch offices of the national-level departments, provincial-level organizations and divisional-level branch offices of the district-level departments, and grassroots-level offices of divisional-level offices, to plan and implement, and monitor water-resources-related programs and activities.

Though there are departments at different levels for managing water resources, they cannot attend to water-resources management tasks in an integrated manner due to their structural and functional gaps. The main structural gaps include the lack of clear policies and organizations at the national and basin level to integrate different sector organizations for IWRM. Functional gaps include lack of effort in institutions and organizations to face future challenges through improved water management and control of water pollution. Other functional gaps as observed in the research are narrow foci on water resource management, inadequate decentralization and lack of accountability.

Structural and functional changes in the institutions are necessary to overcome these institutional problems. The structural changes proposed are the establishment of a National Water Resources Authority (NWRA), Water Resource Council (WRC) and Water Resources Tribunal (WRT) at the national level and River Basin Organizations (RBOs) at the basin level, and formulation of new Acts for IWRM. The functional changes proposed for the institutions are changes of roles and functions, devolution of authority and improved monitoring for enhanced accountability.

Responses of the participants for the institutional changes proposed by the study team were as follows:

- The Secretary for Water Management who was the first to respond said that the presentation was a comprehensive analysis on the water-resources management problems and associated institutional weaknesses in Deduru Oya. He agreed with the changes proposed and suggested that the present District and Divisional Agricultural Committees could serve as District and Divisional Agricultural-cum-Water Resource Management Committees. He added that new institutions would not work and thanked the study team for proposing to strengthen the existing District and Divisional Agricultural Committees to take up water resources management activities. The RBO in an appropriate form could be linked with provincial authorities after careful study.
- The Secretary of Irrigation and Water Resources Management responded in a different way. There were too many institutions in the country for water resources management and he raised doubts about the need for new institutional arrangements like RBOs for IWRM. For example, enough laws already exist and a multitude of land laws were linked with water. From his point of view, Sri Lanka was not short of water, and some temporal and spatial shortages could be overcome through the proper functioning of the existing institutional framework. After the presentation of the Deduru Oya case study, he made the point that the existing institutions are not properly functional mainly because of one single constraint: political interference. However, he admitted that the government is committed to promote IWRM.
- In the discussions that followed, two important suggestions emerged: a) no institutional arrangement will be effective without sufficient legal authority; b) we need to analyze the present status and think how best it can be adapted to meet future needs in terms of natural resources management.
- The intervention from the representative of the Provincial Environmental Authority pointed out that, often, there was no mention of Provincial Councils. Although enough legal bases exist for Provincial Councils to be effective, there is still some reluctance on the part of Central Government agencies and functionaries to part with their authority and make PCs functional. Otherwise, PCs and their respective administrative mechanisms could support the implementation of IWRM strategies at the basin level.
- One strong suggestion from the district-level officials was that a specialist agency was essential for IWRM and RBM to be effective, and the expected effective coordinated actions in allocation and environmental protection could not be expected from existing DACs and DSACs.
- Interdependency among various stakeholder groups is essential for settling the question of “who gains, who loses?”
- Overreliance on macro-level analyses can give a lopsided view of the actual ground situation. Particularly in the case of water resources, it is essential that micro-level analyses are undertaken. At the country level, Sri Lanka may not be seen as a water-short situation, but at the farm and household level, there are significant water shortages in terms of

seasonal or spatial variations. Therefore, for effective water resources management, a basin-level analysis and an institutional strategy would be very useful.

- Many participants pointed out that existing institutions are not in a position to implement rules and regulations for water and other natural resources management due to political influence. The proposed institutions too will face the same fate unless politicians at different levels are made aware of the danger of political interventions through workshops and other means. Notwithstanding this the participants emphasized the importance of political will in implementing IWRM in the country.

Institutional Changes Proposed by the Study Team

The structure proposed for RBO is a four-tier committee structure comprising the basin level on top of the hierarchy followed by the district level, the divisional level and the Agrarian Development Center level. These committees at district, divisional and agrarian center levels are existing agricultural committees that are strengthened to undertake water resources management responsibilities at different levels. The committees comprise agency officials, politicians, representatives of community based organizations, NGOs and the private sector representing different levels such as basin, district and divisions. Functions proposed for the RBOs were to prepare river-basin plans, monitor activities implemented in the basin for compliance with river basin plans and IWRM policy, refer appeals and disputes to WRT, communicate with DACs, DSACs and ADCs in the basin, maintain databases and work with environmental authorities to control pollution. Similar new functions were proposed for the DWMCs (former DACs) and DWRMCs (former DSACs) and ADCs to undertake IWRM activities at the respective levels of the basin.

The study team further discussed the action initiated by them with the collaborative government agencies to establish IWRM in the basin. These activities were mainly, a) awareness creation at ADC, DS, District and Provincial levels on water resources management problems, IWRM concepts and the importance of RBOs, b) stakeholder consultation over institutional changes for better water resources management, and c) carrying out special studies on legal provisions for setting up RBOs at provincial level and on lift irrigation and groundwater extraction.

Finally, the study team proposed several actions for WRS to establish IWRM in the basin. They included careful review of IWMI reports on Deduru Oya, establishment of pilot-scale RBOs for Deduru Oya basin, introducing changes in DAC and DS-level agricultural committees for IWRM, initiation of action through RBO for implementing IWRM activities (river sand mining, water quality deterioration, and action for water allocation/resolving disputes/deciding water rights, etc.).

Responses of the Participants

The participants responded to the institutional changes proposed at national and subnational levels after lengthy discussions at group meetings held at the end of the workshop. The responses for the institutional changes at the national level were as follows:

- Participants accepted the appropriateness of the NWRA and WRT. They pointed out that the role of WRC was unclear.
- They agreed that functions proposed for NWRA and WRT were appropriate but that the functions of WRC were unclear from their point of view.
- Strengths of the NWRA and WRT are that they are independent bodies with legal authority, with the capacity for scientific decision making. They adopt transparent processes and procedures in planning and implementation of proposed activities.
- Institutional weaknesses include lack of authority and clear roles and functions for WRC. Placement of these institutions under a sector minister was seen as a weakness.
- Enabling conditions proposed by the participants to the institutions is to place them under the Head of the Government and provide legal authority to the WRC.
- Risks that the institutions would encounter are nonacceptance by political authority, opposition by interest groups and media campaign against the proposed institutions.
- Assumptions made by the participants for the establishment of IWRM institutions included a) the proposed Water Resources Act will be accepted by the general public after consultation with them, b) the proposed institutions have the blessings of the politicians, c) the Act will be passed by the Parliament, and d) sector agencies would cooperate in implementing IWRM.

Responses to the Subnational-Level Institutions Proposed by the Study Team

- The participants proposed a provincial-level committee headed by the Chief Secretary of the province in addition to the committees proposed by IWMI researchers. They accepted the appropriateness of the committee structure proposed by the researchers. However, they wanted to make the committees at district and divisional level for IWRM to function as subcommittees of DACs and DSACs.
- They proposed regulatory functions and coordination with the center and other relevant agencies in the basin as the functions of the proposed committee at provincial level. The strengths of the provincial-level committee are that it has power and authority, as it is headed by the Chief Secretary of the province. In addition, it has political power and authority too as a provincial administration body. The weakness of the committee is that the Chief Secretary has no authority over central government agencies and their officials and there is the possibility for interference by politicians at provincial levels. Enabling conditions for these committees are material, financial and technological support by the center and political support. The assumption made for successful functioning of the committee is that a master plan would be developed at provincial level for IWRM with the involvement of all the agencies and then implementing the plan. The participants foresaw risks such as financial restrictions and abrupt changes of priority for the functioning of the provincial-level committee.

- The respondents agreed with the functions proposed for the RBOs and saw professionalism and technicality as its strengths. Its weaknesses are lack of experience in the new activity and its accountability to both the center and the province. An enabling condition for the RBO is physical, financial and technical support from the center and better understanding with both the center and the province. It was assumed that the RBO would be staffed by highly competent professionals and would maintain relevant databases for IWRM and function as a statutory body. Risks involved are the possibility of protests against the organizations by the public, especially by farmers. Also the RBO would tend to become a central organization just like other central government organizations not willing to decentralize its power and authority.
- Functions given to the district-level committee are appropriate and adequate in view of the participants. Its strength is that it is a subcommittee of DAC with statutory power under the chairmanship of the district secretary. A weaknesses of the committee is that it does not have officials with knowledge and skill to address IWRM issues. To enable the committee to attend to IWRM activities, the existing acts and ordinances need to be amended. It is assumed that the district secretary has authority to appoint professionals with knowledge on IWRM for the committee to effectively attend to IWRM. The main risks are the differences in opinions of different sector organizations representing the committee.
- Functions of the committee at DS level too are appropriate and adequate according to the participants. Its strength is that it is a well-established committee. Its main weakness is that it is represented by diverse interest groups that may differ in their opinion. To enable it to function properly, the participation of local politicians is required. It is assumed that different stakeholders would participate in the committee for it to handle IWRM effectively. Participants are of the view that political interventions would be a risk to the proper functioning of the committee.
- A function proposed by the participants to the committee at the agrarian development center level (grassroots level) is planning and implementation of production and protection activities with the participation of different stakeholders and establish IWRM in their localities. Enabling conditions are greater awareness of IWRM by the stakeholders and due recognition to the stakeholder representatives by the agencies concerned. It is assumed that different resource user groups would be represented in the committee. The main risk involved is that members would not contribute effectively to the activities of the committee as the representatives are voluntary workers who would not be compensated for their work.

**River-Basin Planning Pilot Project: I-NWRA Workshop
on Deduru Oya Basin Planning**

Minutes of the Meeting Held at the Kandyan Reach Hotel on 17 May 2002

Number of participants: 42

1. The Director General, I-NWRA, welcomed all participants and commenced proceeding of the workshop according to the agenda. After explaining the purpose and objectives of the workshop and the present status of the policy he continued, "Today's workshop is the beginning of a longstanding collaborative approach to prepare a water resource management plan for the Deduru Oya river basin." The reason for selecting Deduru Oya as a pilot basin is existence of critical uses related to water resources and river environment in the basin.
2. Director, Field Services (DFS), I-NWRA, was invited to make a brief presentation on the proposed pilot studies and the details of the institutional support to be given under the ADB-assisted Water Resources Management Project (WRMP).
3. Mr. Paul Taylor, Aus AID Consultant, made a presentation on the contemporary river-basin planning. It included reasons for the approached relationship between RBOs and plan implementation.
4. Major Water Agencies in the basin were invited to make brief presentations on the issues related to the respective water agencies. Regional Director of Irrigation presented issues related to irrigation water; at present, the command area under the ID is 5,800 hectares; this was proposed to be extended by 1,200 hectares under the Deduru Oya reservoir with a hydropower potential of 1.5 MW. He also mentioned that future water resources development plans would provide water for all sectors.
5. Chief Engineer, Planning of the NWS&DB, Kurunegala region presented the overall water resources requirement in the region and construction for extension of services. Additional Director, Engineering of the North Western Provincial Council explained the role of the Provincial Council in the management in the province and expressed concern over the lack of a mandate for certain functions for better water management.
6. During the discussion the participants presented major issues related to the basin. Sand mining was the most concerned issue. Controlling of sand mining has become an impossible task due to lack of political support and involvement of influential people with mechanized systems to exploit sand mining, which is causing devastation to the river regime.

7. Lack of a water allocation system and environmental issues related to the Pannala irrigation scheme were highlighted by the Provincial Directors of Agriculture.
8. In the afternoon session, the Aus AID Consultant explained the steps to be taken by the various basin entities in the planning and organizations for the implementation of the plan.
9. Director, Field Service of I-NWRA, presented the concepts related to basin organization and the content of the plan. An account of the provisions under the water act and the component to be included in a comprehensive plan, institutionalizing the process of planning and respective responsibilities of various basin entities in the River Basin Committee were also presented. He also emphasized the need of appointing a technical working committee until full membership of the River Basin Committee (RBC) is identified.
10. All participants actively participated in the discussion and highlighted pressing issues related to water and environment such as:
 - a. Control of sand mining and enforcement difficulties. They also reported that there is a proposal by GS&MB to promote artificial sand as an alternative to river sand.
 - b. Water-quality issues related to solid waste, hospital waste.
 - c. Water rights.
 - d. Watershed management encroachments of conservation areas.
 - e. Need of a powerful act to supersede laws where noncompliance has taken precedence.
 - f. Maintenance of watercourses (suggested to entrust to farmers under Irrigation Ordinance).
11. Director General, I-NWRA, explained the future actions and invited participants to suggest membership for the technical committee. The agency representatives expressed their support to the idea and suggested the importance of having a permanent office for the river basin committee. Representatives from I-NWRA explained: "This is a long and evolving process and it is encouraging to note the suggestion." Consensus was reached at the discussion and the Provincial Engineering Department came forward to facilitate the collaborative approach in developing the plan for Deduru Oya.

The following key players were identified for the interim River Basin Committee:

- North Western Provincial Council
- Provincial Environmental Authority
- Regional Irrigation Department
- National Water Supply & Drainage Board
- Geological Sand and Mining Bureau

- Water Resources Board
- Provincial Directors
- Additional/District Secretaries
- Forest Department
- Provincial Land Commissioner
- Kurunegala MC

Establishment of an Upper Pampanga River-Basin Coordinating Council in the Philippines: A Proposal

Background

“Water is life.” This short but meaningful phrase underscores the importance of water to all forms of life. Surely, without water, life on this planet will be unimaginable and impossible. The availability of usable water now and in the years to come is increasingly becoming a vital concern for developing and developed countries throughout the world. With the unprecedented increase in the world’s population, the use of water by the various sectors will even be more competitive in the future. This is aggravated by the rapid denudation of the watersheds and the pollution of the freshwater resources due to increasing urbanization and high population growth rate.

The Philippines as a country may not be an exception to such a grim reality and scenario as far as water availability is concerned. At present, the gravity of the problem may have not reached an alarming level. However, if the decreasing trend in the available usable water continues, then the future generation is doomed to a bleak future.

It is therefore imperative upon all sectors, both private and public, to look into this issue, specifically on how to address the problems concerning water utilization and conservation. In other words, measures to minimize wastage and avert possible conflicts among different water users should be identified soonest.

One way to approach this problem is to assess the water situation at the river-basin level. The conditions obtaining in a river basin need to be fully understood; otherwise, planning and implementation of programs to address the water-related problems may be brought to naught.

The Central Luzon State University in collaboration with the National Irrigation Administration has just concluded the first phase of a research on “Development of Effective Water Management Institutions in the Upper Pampanga River Basin.” The aim of this research, funded by the ADB through IWMI, is to assess the existing physical, social and institutional situation associated with water resources within the UPRB; identify the issues related to water management and formulate an action plan for an effective water management in the basin. In general, the result of the study indicates that the basin still has abundant water resources: both surface water and groundwater. Surface water becomes deficient only during the dry months but there is adequate groundwater that can be harnessed to fill the shortage if properly tapped. The water quality in the basin is still at an acceptable level but it is foreseen that this will deteriorate if the present practice of dumping of garbage and waste products in waterways by residents, particularly those in the highly populated places, will persist. No single agency was found to have complete information about the basin. The condition of the watershed has to be improved to prevent the decreasing trend of available usable water in the basin.

With the foregoing results of the diagnostic study, it was highly recommended that a river basin coordinating council that will oversee the activities within the basin be established.

Functions

Essentially, the proposed council will be responsible in orchestrating the planning, implementing and evaluation of an IWRM program aimed at improving the water management in the UPRB. Specifically, the council will serve as a policymaking body and a clearing house of ideas as far as planning and implementing programs and activities relevant to the effective and efficient water management in the UPRB are concerned. Initially, the programs and activities may focus on addressing the problems identified in the diagnostic study, such as follows:

- a. Improvement of the irrigation system performance.
- b. Improvement of the temporal and spatial availability of water, strengthening and rationalizing the measurement, gathering and recording of hydrologic, land and socioeconomic data.
- c. Monitoring and evaluation of the quality of surface water and groundwater
- d. Improvement of the utilization of water in the basin.
- e. Establishment of a database for the basin.

Composition of the UPRB Coordinating Council

Considering that the geographic location of the basin is mainly within the province of Nueva Ecija, it is proposed that the council be chaired by the Provincial Governor of Nueva Ecija with members representing the different water stakeholders in the basin. Initially, these stakeholders may include the following:

- a. National Irrigation Administration: Upper Pampanga River Integrated Irrigation System (NIA-UPRIIS)
- b. National Power Corporation (NPC)
- c. Department of Environment and Natural Resources (DENR)
- d. Local Water Utility Administration (LWUA)
- e. Irrigators' Association (IA)
- f. Central Luzon State University

The role/terms of reference for each agency to be involved in the council will be jointly defined during the roundtable discussion to be scheduled for that purpose.

The Research Team from CLSU that conducted the diagnostic study may initially serve as the Secretariat of the Council.

Procedure

During the organizational stage, the following procedures will be adopted:

The concept paper will be sent to the heads of the prospective participating agencies or organizations to solicit initial reaction about the proposal either through courier service or by mail. After a week, with or without a reply the agency/association will be visited by the research team to have a meeting and exchange of opinion with the agency/association heads and invite them to a roundtable discussion concerning the proposal to crystallize opinions about the proposed council. The roundtable meeting will be held two weeks later.

Two weeks after the roundtable discussion, a copy of the revised proposal will be sent to the participants with the invitation for a final meeting and for the signing of a Memorandum of Understanding by the heads of the different concerned agencies, thus formalizing the establishment of the Upper Pampanga River Basin Coordinating Council (UPRBCC). This will take place a month after sending the invitation.

After the council has been formally organized, the Council will meet bimonthly to tackle its mandated functions preferably at the Provincial Capital for the convenience of the Chairman, the Provincial Governor.

Funding

During the organizing phase, funding support will be drawn from the research project funded by the International Water Management Institute. Fund solicitation from several sources will be done for the operational budget of the council.

Annex 5

**Policy Dialogue on Integrated Water Resources Management
in a River Basin**

Proceedings of a Workshop Held in Kathmandu, Nepal

19 March 2002

**Water and Energy Commission Secretariat (WECS),
Department of Irrigation (DOI)**

and

International Water Management Institute

Dhruba Pant and Umesh Nath Parajuli, editors

April 2002

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Acronyms

ADB/M	Asian Development Bank/Manila
CBO	Community-Based Organization
CDO	Chief District Officer
DDC	District Development Committee
DDWS	Department of Drinking Water and Sewerage
DIO	District Irrigation Office
DWRC	District Water Resources Development Committee
HMGN	His Majesty's Government of Nepal
IAAS	Institute of Agriculture and Animal Science
IWMI	International Water Management Institute
IWRM	Integrated Water Resources Management
MDS	Melamchi Diversion Scheme
MOWR	Ministry of Water Resources
MWSP	Melamchi Water Supply Project
REDP	Rural Energy Development Program
VDC	Village Development Committee
WECS	Water Energy Commission Secretariat
WUA	Water User Association

Foreword

The policy dialogue workshop was held to facilitate the interaction on the issue of river basin management in the context of Integrated Water Resource Management (IWRM), between policymakers, researchers and other professionals involved in water resources development. The need for IWRM is felt by the policymakers. However, institutions for the development of water resources follow a sectoral approach. The mechanism for river basin management is inadequately developed largely due to the minimal conflict in water allocation at the river basin at present. Nevertheless, there is a growing concern to develop an appropriate mechanism for river basin management. In this context, the workshop was important in the exchange of ideas based on the findings of the river basin studies. This is reflected in the remarks of higher officials at the policy level.

The Water Energy Commission Secretariat (WECS), Department of Irrigation (DOI) and IWMI would like to express their gratitude to Dr. Rameshananda Vaidya, Member, National Planning Commission for his thought-provoking ideas and for his time despite the busy schedule; to Mr. Lok Man Singh Karki, Secretary, Ministry of Water Resources and Mr. Keshav Bahadur Chand, Executive Secretary for their thoughtful addresses at the workshop; and to Drs. Madar Samad and Madhusudan Bhattarai who deserve special thanks for taking their time to attend the workshop and their active participation to make the workshop successful.

The organizers would like to thank all the participants for accepting the invitation and for their active participation in the deliberations. Last, but not least, the organizers would like to thank all the individuals involved in the management of the workshop to make it a success.

Workshop Introduction

Water is among the most essential requisites to maintain the ecological balance and human life. Presently, availability of water is becoming scarce and its quality is degrading continuously; on the other hand, the demand for water is growing due to the country's population increase. The situation is further aggravated by the high degree of temporal and spatial variation in the availability of water. In Nepalese rivers, about 80 percent of the total annual flow occurs during the 4 months, June to September, with the rest occurring during the remaining 8 months. This results in an alternative cycle scenario of excess and scarcity. The trend towards an increase in freshwater demands and decreasing water supply, especially during the dry months, has increased intra-community, intercommunity and inter-sectoral conflicts in use and share of water. It has therefore become essential to evolve an integrated approach in the development and management of water resources at the basin level.

The development of an appropriate institutional mechanism to plan, implement and introduce policy reforms is one of the key areas for the management of water resources in a river basin. Nevertheless, the task of such institutions is influenced by the stages of water resources development in the basin. Although local institutions that have evolved over a period of time through users' actions were capable of managing water resources, which were sustainable in the past, they have become incapable of handling the new challenges brought by increased competition between various water use activities as a result of the use of new water management technologies and external interventions.

Recently, the WECS prepared a Water Resources Strategy, which has already been approved by His Majesty's Government of Nepal. Although the Water Resources Strategy has envisaged the concept of river-basin management as a policy tool for the development of water resources in Nepal, there is little practical experience and knowledge on how to operationalize the concept of river-basin management.

In the international arena, the river basin approach for the management of water resources is gaining importance and IWMI is involved in conducting research on various aspects of water management in a river-basin context. Of these aspects, one is research related to the promotion of appropriate institutions for water resources management at the basin level. In this context, in Nepal, IWMI in collaboration with WECS, DOI and IAAS conducted studies on Integrated Development and Management of Water Resources in a few river basins. These studies conducted in Nepal were a part of the regional study funded by the ADB. In addition to Nepal, countries included for this study were China, Indonesia, Philippines and Sri Lanka where river basins of varying characteristics exist.

This workshop is the end of this part of the study, where several aspects like institutional, environmental, economic, hydrological and social issues in a river basin were studied. The workshop was intended to facilitate dialogue between policymakers, academia and researchers to understand the institutional dynamics of river basin management in the river basin and explore the possible institutional options for water management in the river basin.

Workshop Program

As part of the research activity, WECS, IWMI and DOI jointly organized a workshop for policy dialogue on “Integrated Water Resources Management in a River Basin” at Hotel Hyatt Regency, Kathmandu.³ The followings were the objectives of the workshop:

- Disseminating the research results and identifying key policy issues.
- Initiating discussions on several policy issues related to IWRM in a river basin.
- Identifying further research activities in the coming year.

It was a one-day workshop, which had four sessions. These included one opening session, two presentation sessions, and one concluding session. In the workshop, three papers were presented.

Opening Ceremony

Mr. R. N. Kayastha, Project Manager, Water Resources Strategy Formulation Project, WECS, formally opened the ceremony and welcomed all the participants in the workshop. Mr. L.M.S. Karki, Secretary, Ministry of Water Resources chaired the opening ceremony. Dr. Rameshananda Vaidya, Hon. Member, National Planning Commission was the chief guest. Followings are the views expressed by the key speakers at the opening ceremony.

Mr. R. N. Kayastha, WECS

In addressing the opening ceremony, Mr. Kayastha, first, briefly presented the country’s status of water supplies from different sources and the demand for water for several uses. He further noted that in Nepal water is not available in the required quantity and quality where needed, and when needed. This asymmetry between the supply and demand of water due to its temporal and spatial variation has put tremendous pressure on the government’s capacity for the development and management of water resources. As a result, the development of water resources has remained far below its huge potential.

Mr. Kayastha further noted that with the increase in population and changing socioeconomic conditions, water demands are also increasing rapidly leading to intra-community, intercommunity and inter-sectoral conflicts in use and share of water. This is mainly because, until recently, development and management of water resources have followed a sub-sectoral approach in isolation from one another. Increasing competition for the use and share of water has necessitated an integrated approach to manage water resources. Accordingly, Nepal’s ninth five-year development plan emphasized the integrated development and management of water resources.

³The detailed workshop program and list of participant are given in the annex.

In this context, Mr. Kayastha also highlighted the concept of IWRM, which emphasized:

- Institutional issues and capacity building.
- Decision making on development and management of water resources for various uses taking into account the needs and desires of different users and stakeholders.
- Interests in use, control or preservation of water systems and their sustainability.

Mr. Kayastha further noted that in order to pursue the concept of IWRM three functions need to be considered. These include the operational or water use functions; the organizational or water resources management functions; and the constitutional or water policy and legislation functions. He also added that for the sustainability of the program, water resources management needs to be implemented at the river-basin level.

In continuing his opening address, Mr. Kayastha mentioned the recent approval of the country's water resources development strategy by the government, and proposed that institutional reforms are the steps taken towards implementing the concept of IWRM. The next step in this process is to develop a National Water Plan consisting of detailed and comprehensive action plans with investment programs for the short, medium and long term.

Finally, Mr. Kayastha hoped that the workshop, which was intended to discuss the findings of studies conducted jointly by WECS, DOI and IWMI, on the East Rapti and the Indrawati river basins, would be able to draw important lessons for the preparation of a national water plan. In this context, he requested all the distinguished participants to participate actively in the discussions related to policy dialogue on IWRM.

Dr. M. Samad, Theme Leader, IWMI

The next speaker, Dr. M. Samad, Theme Leader, IWMI, first welcomed all the participants in the workshop. He informed the participants that this study on river-basin management, especially focusing on institutional issues, has been conducted in Nepal by IWMI for the last 2 years in collaboration with WECS and IAAS as national partners. Dr. Samad also mentioned that this study is a part of the regional study funded by the ADB. In addition to Nepal, countries included for this study are China, Indonesia, Philippines and Sri Lanka where river basins of varying characteristics exist. He also highlighted the objectives of the study, which are:

- To understand the major issues related to river-basin management.
- To find out appropriate institutional arrangements for river-basin management.

In addressing the workshop, Dr. Samad mentioned that this workshop is the end of phase one of the research, where several aspects of river basin management like institutional, environmental, economic, hydrological and social issues were studied. He hoped that this workshop would provide a synthesis of the work done in phase one of the study, and would come out with an action plan, which will be implemented as an action research in the next phase.

Finally, Dr. Samad highlighted the major purposes of all the three papers, which were selected for presentation in the workshop. In presenting his opinion, Dr. Samad hoped that even though

the workshop might not be able to answer all the questions, it will certainly promote dialogue on IRBM, which is the main objective of the study.

Mr. S. P. Sharma, Director General, Department of Irrigation

Mr. S. P. Sharma, Director General of the Department of Irrigation, in his opening address stated that the past studies conducted by IWMI in collaboration with DOI have been very useful in taking appropriate measures to overcome the implementation-level problems. In this context, he also hoped that the recently conducted studies on several river basins would also be helpful in formulating policies for integrated management of water resources and thereby reducing the inter-sectoral conflict.

Mr. Sharma mentioned that there have been several external and internal interventions on the use of new water technologies, which have increased access to the use of water resources. These technological interventions, however, focused largely on the sectoral approach and failed to address the issues related to holistic management of water resources in river basins. In this context, Mr. Sharma hoped that the recently approved water resources strategy would give new direction for integrated use and development of water resources.

In continuing his remarks, Mr. Sharma mentioned that, in the past, although local people had been successful in evolving appropriate institutional mechanisms in managing water resources in the community, these mechanism may not be able to cope with the changes brought about by technological interventions. Therefore, he suggested that one key area for the development of the water resources in a river basin is to devise appropriate institutional mechanisms to plan, implement and introduce policy reforms as required through the stages of water resources development in a basin. He added that in the context of multiple actions being taken by several agencies at the local level, there is a need to look at the role played by various agencies within the framework of existing policy, legal and institutional setup. Such a study would help identify key issues that need to be tackled in facilitating new institutions.

Finally, Mr. Sharma hoped that the deliberations of the workshop would look into various aspects of institution development and would recommend appropriate institutional mechanism for river basin management.

Dr. Rameshananda Vaidya, Hon. Member, National Planning Commission

In his opening remarks, the chief guest of the workshop, Dr. Rameshananda Vaidya, Hon. Member, National Planning Commission, stated that with the initiation to formulate a National Water Plan and the recent approval of the country's water resources strategy, Nepal is now moving towards integrated management of water resources.

In expressing his opinion, Mr. Vaidya noted that this workshop is a timely event, especially in the present context where Nepal is formulating its tenth five-year development plan. In this context, he suggested that three issues need to be addressed in actualizing the concept of IWRM in planning for development. These issues are:

- Water and micro economy.
- Management of a larger basin at the regional level.
- Access to technological input for poverty alleviation.

Referring to the first issue, he mentioned that discussions on IWRM should not be limited to water alone. Water-related issues should be linked with the micro-economic issues of the country. Mr. Vaidya stated that the country's growth rate in the agriculture sector is much below expectations and that it needs to be raised in the coming years. So, he urged the participants to think that water planning should be tied up with the agricultural planning in order to raise the agricultural productivity with respect to the country's overall investment. Explaining the causes of low agricultural productivity, Mr. Vaidya mentioned that although APP provided a thrust in managing several inputs (irrigation, fertilizer, roads, etc.), it failed to promote agricultural marketing. As a result, farmers do not have incentives to produce more agricultural products.

Referring to irrigation development, Mr. Vaidya mentioned that although the ninth five-year development plan aimed to develop about 142,000 hectares of new irrigated area, achievement was only about 62 percent. Failure to promote an agricultural market is the primary reasons for this, which in turn could not promote farmers' investment in the development of groundwater irrigation as targeted. So he suggested that issues related to the agricultural market, which is the only incentive for farmers to increase agricultural productivity, should be properly addressed by the IWRM in planning water for development.

The second issue raised by Dr. Vaidya is management of water at the regional level. He mentioned that in dealing with IWRM, focus should not be limited to smaller basins like the Indrawati and East Rapti, but that it should also be directed to larger basins at regional level where plenty of opportunities exist for development. He also mentioned that by focusing on the larger basins like Ganges, Brahmaputra and Megna at a regional level, a better strategy could be developed for future regional cooperation in water.

In this context, he informed the participants that Nepal raised the issue of river-basin management at subregional level in the tenth SAARC meeting held in July 1998. In October 1998, this issue was also raised at the UN general assembly. Dr. Vaidya believed that living standard of the people of this region, which is characterized by endemic poverty and a population growth rate of about 2 percent per annum, could be raised only through regional cooperative effort in developing irrigation, hydropower, flood-control measures, environmental-mitigation measures and in land navigation. So he urged the participants to think about integrated management of larger basins at a regional level, crossing international boundaries of Bangladesh, Bhutan, India and Nepal.

The third issue raised by Dr. Vaidya is the "access to technological inputs and resources" for poverty alleviation. These include irrigation, fertilizer, telephone, micro-hydro and so on. Referring to the experiences of the ninth five-year development plan period, Dr. Vaidya mentioned that these technological inputs have certainly helped raise the livelihood of our rural community. However, he thinks that a very limited number of people have access to these technological inputs and resources, as a result of which, the equity issue has been emerging seriously in Nepal's planned development effort. So he raised the question: "How can we create access to these technologies and resources for major sections of our rural communities from the perspective of poverty reduction?" He argued that unless this equity issue is solved, the development process of the country is not likely go ahead.

In this context, Dr. Vaidya mentioned that several new concepts are emerging in the coming tenth five-year development plan starting from July 2002. These include participatory irrigation development with a detailed action plan, integrated management of water resources, and management of the river basin and so on. He hoped that these concepts would help in creating equitable access to technological inputs and resources for rural communities. He requested the

participants of this workshop and also of the forthcoming workshops to think seriously on the issue concerning equitable access to technological inputs, and come out with certain ideas in his regard.

Finally, referring to the papers to be presented in this workshop, Dr. Vaidya expressed that many of the issues that the workshop is going to discuss are related to the challenges being faced by the country. He thus hoped that the outcomes of the workshop would help address the abovementioned three issues, especially the last one, i.e., equitable access to technological inputs and resources.

Mr. K. B. Chand, Executive Secretary, WECS

The next speaker of the opening ceremony, Mr. K. B. Chand, Executive Secretary of WECS, first expressed his happiness on behalf of WECS on this occasion where participants could share and discuss research results on the Indrawati and East Rapti river basins. He hoped that the deliberation of the workshop would be very much helpful to the National Water Plan, which is being formulated by WECS based on the findings and recommendations made by recently approved water resources development strategy of the country.

Referring to this strategy, Mr. Chand stated that one key policy tool outlined by the strategy is the holistic approach in managing water in river basins. This management approach is considered as an effective and viable means for resolving the issues arising due to competing uses of water across several sectors. Mr. Chand further stated that this approach, which is the focus of the workshop, would also help ensure increased economic productivity, equity and sustainability.

As the papers selected for presentation in this workshop are based on the case studies, Mr. Chand hoped that these papers would be able to advance discussions on several issues of IWRM. He further hoped that the workshop would come out with a certain action plan to move ahead in the next stage of the research.

Mr. Lok Man Singh Karki, Secretary, Ministry of Water Resources

In concluding the opening ceremony, the Chairman, Mr. Lok Man Singh Karki, Secretary, Ministry of Water Resources, expressed that despite abundant water resources available in the country, its management has remained a challenge for the planners and implementers. To cope with these challenges, he added, His Majesty's Government of Nepal has recently brought out the country's water resources development strategy, which envisaged the river basins as the planning and the management units with appropriate institutional arrangements.

Referring to the present institutional arrangements, the Chairman noted that there are several agencies involved in the management of water resources in a basin. Further, the Local Governance Act has clearly empowered the local elected institutions by providing autonomy to use and manage water resources within their area. In this context, he asked participants to examine whether strengthening the existing institutions will suffice for the purpose of attaining sustainable development through a basin-wide approach or whether the reorganization of new institutions is required.

In continuing his statement, the Chairman also highlighted the principles of supply and demand management adapted by the country's water resources strategy in order to pursue the concept of IWRM. In elaborating these principles, he stated that provision of licensing for the use of water resources to be issued by District Water Resources Committee is a tool for supply management.

Similarly, focus on water-saving technologies for efficient use of water resources and conservation of supplies through water harvesting and conjunctive use of groundwater are the approaches taken for demand management.

He further stated that effective coordination and linkage among different water-related agencies, and active people participation with the mandatory provision to involve women in the process of decision making are some of the important concepts adapted by water resources strategy towards the direction of IWRM. He hoped that with these concepts, conflicts over the uses of water would be minimized and that sustainable management of water resources in a basin could be achieved.

Finally, he hoped that the outcomes of the workshop would be useful in addressing policy issues in the process of operationalizing the concept of IWRM through the recently approved country's water resources development strategy.

Outcome of the Workshop

In the workshop, three papers were presented. This section first presents a summary of these papers, followed by a summary of discussions on issues raised in the floor.

Summary of Papers Presented in the Workshop

IWRM - A Case of Nepal

Khem Raj Sharma and Iswer Onta

The paper has chronologically synthesized the past policy provisions, legislation and institutional aspects in relation to water resources development. While doing so, the paper has also highlighted the policy outcomes and implications. This was done by assessing the achievements made so far in three different sectors: domestic water supply, irrigation and hydropower with respect to the stipulated objectives of their development.

The paper also highlighted the major policy principles outlined by the recently approved Water Resources Strategy of the country, which focuses on the concept of IWRM. Recognizing past weaknesses in effective implementation of several development strategies of the country, the paper also presented a cyclic implementation program approach in order to put IWRM into practice. The cyclic implementation program approach encompasses:

- A national legislative and institutional framework.
- Regional cooperation.
- Planning.
- Financing and implementation.
- Monitoring, evaluation and research.

The paper has drawn the following conclusions:

- With the increasing scarcity of water resources, water sharing between and among sectors in a particular river basin has to be carried out in an equitable manner. It has therefore become essential to evolve an integrated approach in the development and management of water resources at the basin level. The need of the day is therefore not to ask questions on why IWRM, but to think on how to implement IWRM.
- Although the existing Water Resources Act paved the way towards the establishment of District Water Resources Committees (DWRC) in order to manage some aspects of water resource development, it has not been functional as planned. This is mainly because DWRC has not been properly set up, manned, trained and supported in the concepts of IWRM.
- In order to promote the optimal use of water resources in basin-wide perspectives, there is an immediate need to address the shortcomings in the institutional setup, planning and implementation processes at the national level.

Major Issues and Concerns in East Rapti and Indrawati River Basins: A Comparative Analysis

K. R. Adhikari and M. Bhattarai

This paper has summarized emerging issues and options for possible implications for basin-level integrated planning of water resources in Nepal. While doing so, this paper has heavily drawn its conclusions from two detailed case studies conducted in the recent past by IWMI in collaboration with WECS, DOI and IAAS. These studies were conducted in the East Rapti and Indrawati river basins. The Indrawati river represents the typical water uses and constraints of the high mountain environment whereas the East Rapti basin represents the situation of Terai areas.

The paper first presented an overall situation of the water uses in the two basins, followed by an overview of water policy and institutional arrangements in relation to IWRM. The paper basically presented a comparative analysis of the two river basins in the following aspects.

- Overview and land use.
- Socioeconomic characteristics.
- Major water uses and related institutions.
- Water accounting.
- Competition and conflicts in multi-sectoral water use.

The paper has drawn the following conclusions and recommendations:

- Institutional adjustment due to external intervention for several uses of water is of major concern in the Indrawati river basin but intercommunity and inter-sectoral conflicts in

the use and share of water, and environmental degradation are of major concern in the East-Rapti river basin.

- In both basins, ample opportunities exist for conservation and efficient utilization of water resources. Water harvesting in the Indrawati river basin and consumptive uses of groundwater resources in the East-Rapti river basin are some of the prominent options.
- Recently, the IWRM framework of planning has received wider acceptance for basin-level water resource management, operationalization of which however needs different strategies to match with biophysical, agricultural and socioeconomic characteristics of the basin.
- Evolution and adoption of appropriate institutional arrangement is a key to actualizing IWRM concepts, which depend on biophysical, agricultural and socioeconomic characteristics of the basin. A host of mechanisms crafted and developed by the local community for several uses of water and long-enduring local institutions could provide a reliable foundation for developing the IWRM framework.
- It is advisable to strengthen existing organizations like VDC, DDC and DWRC for effective management of water resources instead of thinking about a separate basin authority. At present, DWRC is not functioning as anticipated. For its effective functioning, DWRC should have more participation from the local community, and the Chairman of the DDC should head this organization.

Institutional Options for River Basin Management

Ram Nath Kayastha and Dhruva Pant

Recognizing the need of appropriate institutional arrangements for the integrated management of water resources in a river basin, this paper has examined several institutional options. While doing so this paper has first assessed important stakeholders (VDC, DDC, DWRC, and users) and their relationships, current problems caused by water scarcity, conflicts, environmental degradation, and existing institutional setup for managing water. The paper has also examined the institutional setup required for IWRM in a river basin.

The paper is based on several river basins studies conducted in the recent past by IWMI in collaboration with WECS, DOI and IAAS. The paper has also drawn information from other secondary sources.

The paper has suggested that the institutional requirement in a river basin depends on the stages of development of a river, which are categorized into four stages. The four stages are a) the development or construction stage, in which new infrastructures are developed to use the water for various purposes, b) supply management, a stage in which judicial allocation of water has to be made as water becomes a scarce resource, c) integrated water management stage, in which there is inter-sectoral competition and where the task is to manage water allocation for various uses—domestic, irrigation, industrial and environment uses, and d) demand management stage, in which the basin has become closed and the task is to manage the demand for various uses.

In the development or construction stage of a river basin, the existing institutional mechanism (in most cases the customary practices evolved over a period of time) may need to be redefined

to enable them to cope with the changes caused by new developments. With the gradual development of the water resources in the basin, the organizational functions progress from single to multiple tasks. This demands an institutional reform to handle multiple tasks. Thus, the development of institution also progresses with water resources development in the basin. Evolution of such institutions should be facilitated through policy, legal and institutional reforms as required. With the advancement of the development in the river basin there may be a requirement for the establishment of a river basin authority.

The paper has ended with the suggestion of a three-staged action plan to initiate the process for IWRM. These three stages include:

- Preliminary stage.
- Intermediate stage.
- Permanent stage.

The preliminary stage focuses on the initial assessment of endowment of the river basin and identification of the stakeholders and their role for developing plans for the river basin. The intermediate stage focuses on the management of water supply. Initiation of new development activities as outlined in the plans for the economic and social development of the community falls under the intermediate stage. The permanent stage is the demand management phase. The O&M of water use systems and conservation of water resources are the main activities in this stage.

Summary of Discussions on Issues Raised at the Workshop

As noted earlier, three papers were presented in the workshop. Based on the papers presented, participants raised several issues and concerns at the floor. These issues are grouped into three categories, which are summarized and presented below.

Concept of Integrated Water Resources Management

Several participants raised concerns that, in rural areas, as more than 80 percent of conflicts in managing natural resources revolved around water, the concept of IWRM should properly address issues related to water conflict, especially focusing on intra-community, intercommunity and inter-sectoral uses and sharing of water. Citing an example, one participant informed the group that with the implementation of the IWRM concept in the Doti district in the far-western region of Nepal, water-related conflicts were minimized successfully.

In the context of growing concern on environmental degradation and climatic change, which has a direct bearing on the availability of water, the participant raised concern that the IWRM concept should also address environment-related issues. The participant also stressed the need of considering water quality issue by IWRM. It was noted that sometimes the availability of water may be abundant but that its poor quality may not be worth using it.

As the papers presented mostly focused only on water, participants raised concern that the concept of IMWR should not focus only on water, but should encompass integrated management of land, vegetation and water in a holistic approach. The reason is that the availability of water in

a basin is influenced directly by the way the land and vegetation are managed in the watershed. Citing an example, it was mentioned that water control has remained one of the important objectives of managing terraces in the hill slope. As terraces help in recharging groundwater thereby increasing the dry-season base flow of the river and create a surface reservoir during rain, making peak flow in the river downstream less peaky, development or abolition of such terraces in the watershed has direct bearing in the availability of water. The relationship between management of vegetation and availability of water is similar.

In this context, a participant also raised concern that the present modality of managing natural resources in Nepal, which is guided by the sector approach, needs revision. As different institutions are managing these natural resources in their own way, integrated management of these natural resources in a holistic way is not emerging. Lack of a feeling of ownership for such integrated management of land, water and vegetation among the concerned institutions is one of the fundamental reasons for this. Citing an example, one participant noted that although it was planned to implement APP in a holistic approach by integrating several inputs, lack of ownership of an APP program among concerned institutions and the increasing focus to the sectoral approach have devaluated its concept.

Finally, the floor raised some important institutional issues as follows:

- How best can we incorporate local-level planning in the cyclic implementation program approach to IWRM?
- What should be the role of District Water Resources Committee (DWRC) and why is it not functioning properly?
- How best should the private sector be involved in the management of water resources? In this context, participants argued that focus should be directed on promoting water entrepreneurs rather than on involving big national or multinational companies.

A summary of discussions on institutional aspects is presented in forthcoming sections.

Water Accounting: Process and Methodology

Discussions on water accounting were concentrated mostly on the findings of the study focusing specifically on its process and methodology. As noted earlier, the second paper of the workshop concluded that both the Indrawati and East Rapti rivers are open basins and that a significant fraction of utilizable and noncommitted water moves out of these basins. In this regard, the participant raised concern that such conclusions may misinterpret the situation.

The participants noted that a basin consists of several subbasins and micro-basins. Each of these smaller basins supplies water for several uses. Giving an example of domestic water supply systems, one participant noted that a large number of such systems receiving water from these smaller subbasins exist throughout a larger basin. In such a situation, in totality, although a basin may be categorized as an “open basin,” its subbasin may turn out to be a “close basin.” It was thus unanimously agreed that more analysis is required at the level of the subbasin in order to have clear information in managing water. This is because, in the case of Nepal, in aggregate, no river system of this size can have a deficit supply.

Participants also raised concern about the concept of committed or uncommitted flow, which is used in accounting water. One participant noted that in the case of Nepal, as most of the rivers flow to India which ultimately join the Ganges, the concept of committed flow is not applicable although such flows are used downstream.

Participants also raised concern about the method of categorizing a basin “close” or “open” depending on the average annual water balance. This is because the river systems in Nepal exhibit a remarkable temporal and spatial variation in the availability of water. The distribution of river flow is uneven over time and space, and the hydrology of these rivers follows the rainfall pattern. In the monsoonal season (June to September), as the availability of flow is abundant, a basin may act as an “open basin.” In contrast, during the dry season (April to June), as water is scarce in most of the rivers, the same basin may act as a “close” basin.

In this regard, participants suggested that in accounting water of a basin, seasonal availability of flow needs to be considered, and analysis of water accounting should be at least on a monthly basis. It was also suggested that year-round availability of water should be the objective of IWRM.

Concerns were also raised about the methodology of water accounting. The reason is, the methodology used in accounting water did not encompass several other external factors, which can influence the availability or depletion of water in a basin. These factors include nonconsumptive uses (such as hydropower), rainfall, subsurface flow (or the return flow), land use, vegetation cover and so on. Although, usually, the nonconsumptive uses of water are not accounted in computing water balance, sometimes such uses do influence availability or depletion of water in a basin. For example, in the case of the East Rapti river basin, operation of the Kulekhani hydropower⁴ does influence water availability over time, and this factor was not considered in computing water of the East Rapti river basin. Similarly, variations in the rainfall, patchy hydrological characteristics of mountains, changes in land use and vegetative cover in the watershed do influence the availability of water over time and space. Concerns were therefore raised about the need of an appropriate methodology to account for water in a basin.

In this context, one participant mentioned that several hydrological models suitable to the Nepalese conditions are already available in the Department of Hydrology. He further mentioned that these models could be successfully used in accounting water in the Nepalese river systems for integrated management of water resources.

Institutional Options for River-Basin Management in Nepal

Discussions on the institutional issues related to the management of river basins in Nepal were concentrated on the following four aspects:

- Whether the District Water Resources Committee (DWRC) should be headed by the Chief District Officer (CDO) or by the Chairman of the District Development Committee (DDC).
- Organization for river-basin management.
- Institutional options vs. level of development of a particular river basin.

⁴The Kulekhani hydropower operates through a reservoir, for which water is transferred from one basin to another.

- Commitment towards IWRM.

Discussions on the above four aspects are summarized below.

DWRC

Several participants noted that the DWRC is not functioning properly, and the Local Governance Act is not being implemented in its true spirit. This raised the question: “Why isn’t the DWRC functioning properly? One of the issues in this regard is the structuring of its organization. This means who should head the DWRC, the CDO or the Chairman of the DDC?”

At present, as per Water Resources Act, the CDO⁵ heads the DWRC and manages some aspects of water resources development. These include issuing licenses for the development of water resources, registration of organizations for managing several uses of water and so on.

Every district also has a District Development Committee (DDC), which is a political organization, and an elected person heads it. The main task of the DDC is to plan for development activities and implement some development activities in the district. The DDC, however, has a minimal role in the DWRC.

Recognizing the importance of the DDC in the development of water resources, some of the participants argued that the Chairman of the DDC should head the DWRC. The reasons given by this group of participants are:

- As the Chairman of the DDC belongs to the area, he would be more familiar with the local situation and local problems.
- As the Chairman of DDC is elected from the people, he represents them. Involvement of the DDC Chairman in the process of decision making means involvement of the people, which is the focus of IWRM.
- As the main responsibility of CDO is to maintain law and order in the district, he would not be able to handle local water issues.
- It is easier for the Chairman of the DDC to understand indigenous practices of water management, which is an important aspect of IWRM.
- Following the concept of decentralization, power to make decisions should be devolved to the local-level politician, which is the main policy tool of the Local Governance Act.

A few participants, however, argued that the CDO should head the DWRC and decision-making power should also be given to him rather than to the political representative. This is because a political representative might become biased toward his electoral group. As a result of this, there may not be equitable access to water for all sections of the society.

Despite the differences of opinions about the Chairperson of the DWRC, there was consensus among the participants that the roles of DWRC and its linkage with IWRM should be studied in

⁵The Chief District Officer (CDO) is a bureaucratic person appointed by the government. His main duty is to maintain law and order in the district.

detail. It was also agreed that all the acts in relation to the local institutions and water resources need to be reviewed. Recognizing the importance of the Chairperson of the DWRC in terms of its sociopolitical dimension, some participants noted that such issues need to be discussed among the policymaking political bodies.

Organizations for River Basin Management

In a basin, several informal/formal organizations are managing water at the local level for several uses. In this regard, concerns were raised by the participants whether these formal/informal organizations could be coordinated properly for efficient management of water. Some participants highlighted the need for integrating all these informal/formal organizations and linking them with some kind of basin-level organization for regulating and coordinating their activities for efficient management of water resources. To this end, some participants noted that instead of forming a new organization, it is advisable to strengthen the existing organization, that is DDC/VDC and DWRC, by redefining their scope of work.

Some participants, however, argued that the DDC/VDC and DWRC would not be appropriate in managing water at the basin level. This is mainly because the present political/geographical boundaries of VDCs/DDCs will not match the hydrological boundaries of the river basin. The area of one VDC/DDC may extend to more than one basin or one basin may contain several VDCs/DDCs. In such a situation, they raised the question of how a river basin can be managed by the existing organizations.

Irrespective of the above arguments, it was also realized that in managing small basins, existing organization might be more appropriate. However, in the case of large river basins like the Kosi and Karnali rivers, a central-level water authority might be more appropriate for their management.

Further, considering the importance of people's participation in managing water, it was realized that a basin-level organization should have adequate representatives from the local community. Concerns were also raised that all the stakeholders and line ministries of the government should also have adequate representation in the basin-level organization and that their roles and responsibilities should be clearly defined.

Institutional Options Versus Development Level of the River Basin

In discussing the appropriate institutional arrangement for managing the river basin, participants also noted that institutional options vary with the level of development of river basins. Development of a river basin is not static but is dynamic, and changes over time and space. For example, growing demand of water in a basin induces new technologies, which in turn changes the institutional requirement. Thus, it was realized that the institutional requirement varies with the stage of development of a particular river basin.

Commitment to Promote IWRM

Participants raised the question of how committed we are to promote the concept of IWRM. Participants added that if the government is really serious in implementing the concept of IWRM, several other institutional arrangements need to be changed drastically, and these changes should support the concept of decentralization.

In this regard, one participant, however, noted that we should not worry about the government's commitment to initiate the concept of IWRM. He thinks that if we wait for the government's commitments, we may never implement this concept. He further added that the government's commitments could come from two sides: technical and political. Technical groups should at least start implementing the concept of IWRM and make some progress. Accordingly, in due course of time, the political bodies could be well convinced to be bound by political commitments.

Closing Ceremony

Dr. K. B. Aryal, Director, WECS, chaired the closing ceremony.

The first speaker, Dr. M. Bhattarai of IWMI Sri Lanka, summarized the discussions on issues raised in the workshop. These summaries were presented in the foregoing section.

Dr. Rameshananda Vaidya, Hon. Member, National Planning Commission, in addressing the closing ceremony first expressed his grateful thanks to the organizer for organizing this workshop.

Referring to the papers presented in the workshop, Dr. Vaidya mentioned that all the papers could dig out emerging issues, which need to be addressed in implementing integrated management of water resources at the basin level.

While expressing his opinion, Dr. Vaidya mentioned that the concept of integrated management of water resources should not focus only on water, but should encompass integrated management of land, vegetation and water in a holistic approach. Citing examples, the Chairman noted that due to environmental degradation of land and rivers in the mountains, out-migration from the area is increasingly rapidly. The concept of integrating management of these natural resources could improve the situation, which in turn can help raise the livelihoods of rural communities.

Dr. Vaidya added that the river systems in Nepal exhibit a remarkable temporal and spatial variation in the availability of water. As a result, in some basins, availability of water in the dry season is limited. In such a situation, the water-accounting process should also examine the viability of water storage in a basin or interbasin transfer of water from an open basin to a close basin for meeting the future demands of water resources, which has become essential in some parts of the country.

Finally, Dr. Vaidya suggested that more focus should be given to issues such as equitable access to water, poverty and gender, which are key elements for the success of IWRM. So, he requested the researchers to research on "How can access to water resources for major sections of our rural communities be improved from the perspective of poverty reduction?" He argued that unless this equity issue is solved development process of the country is not likely go ahead.

While expressing his opinion, Dr. K. B. Aryal, Director, WECS, stated that each river basin in Nepal has unique sociotechnical characteristics. As a result, the institutional issue in managing such river basins is an important element, which needs to be discussed further. He added that the objective of the workshop is not to recommend certain institutional arrangements, but to identify some relevant issues. In this context, he informed participants that, at present, WECS has established a task force for designing the institutional setup in managing a river basin. Finally, he thanked all the participants for attending the workshop and providing valuable comments. With these valuable remarks, Dr. Aryal adjourned the workshop.

Annex 6

Collaborating Partners in the Five DMCs

Country	Research group	Policy and implementing agencies
PRC	Center for Chinese Agricultural Policy (CCAP), Beijing; Key researchers: Dr. Jikun Huang and Dr. Jinxia Wang	Ministry of Water Resources, and Ministry of Agriculture in Beijing; Water Resources Bureau of Hebei Province
Indonesia	Center for Irrigation, Land and Water Resources and Development Studies, Andalas University, Padang; Key researcher: Dr. Helmi	Directorate General of Public Works, Manila; Directorate of Water Resources and Development, West Sumatra, Padang
Nepal	IWMI's Nepal National Program Office, Kathmandu; Key persons: Dr. David Molden, Mr. Krishna C. Prasad. Research and Technology Development Branch of the Department of Irrigation; Key person: Dr. R. K. Sharma	Department of Irrigation, Kathmandu
Philippines	Central Luzon State University, Munoz; Key researchers: Dr. Rudolfo C. Undan, Dr. Honorato L. Angeles	National Irrigation Administration
Sri Lanka	IWMI's Sri Lanka National Program, Colombo; Key researchers: Mr. Ian Makin, Dr. R. Sakthivadivel and Mr. K. Jinapala	Ministry of Irrigation, Power and Energy, Water Resources Council Secretariat; Irrigation Management Division, Department of Irrigation; and North-Western Provincial Council

Malang Workshop (15-19 January 2001): Summary of Proceedings

The introductory session of the workshop on 15 January 2001, included brief statements from representatives of the four collaborating agencies, and covered the objectives of the workshop and those of its underlying studies:

- Representatives of IWMI and IFPRI explained the objectives of the workshop and welcomed the participants.
- Ir. Rusfandi Usman, the President Director of Jasa Tirta I, introduced his organization's activities in the management of the Brantas river basin.
- Wouter Arriens, speaking on behalf of the ADB, said, "The water crisis in Asia is at heart a crisis of governance. We cannot influence how much water is available, but we can influence how to manage that water. The best practices need to be translated into policies and procedures that can be replicated. Both IWMI and IFPRI are focusing on these issues. The most challenging part of IWRM is how people can collaborate for better water resources planning, development, and management and conservation. ADB shares with its stakeholders a common vision of rivers that provide life to the people and ecosystems of the basins and that support economic development."
- Dr. Ir. Soenarno, the Director General of Water Resources of the Indonesian Ministry of Settlements and Regional Infrastructure formally opened the workshop. His opening remarks stressed the relevance of the workshop for Indonesia's current reforms in governance and water resources management, within which decentralization, stakeholder participation, and public-private partnerships pose new challenges for river-basin management.
- Prof. Frank Rijsberman, Director General of IWMI, delivered the keynote address. He described the formulation of the World Water Vision, which analyzed the challenges of coping with increasing demands for water in the context of different scenarios for technology and values. IWMI is involved in continuing the dialogue on water, food and the environment. He outlined IWMI's concepts concerning three stages in river basin development, as an increasing portion of the renewable supply is brought into use. He highlighted recent innovations in water management such as the spread of treadle pumps in Bangladesh, well recharge in western India, increasing attention to the role of the private sector in many countries, and work in China on growing "more crop per drop," and then echoed the call that "water should be made everybody's business."

Technical Sessions

Tissa Bandaragoda of IWMI introduced the framework for river basin studies, combining water accounting, socioeconomic studies and institutional analysis. This framework is being applied to subbasins in five countries: China, Indonesia, Nepal, Philippines and Sri Lanka. The study is intended to field-test new paradigms for IWRM, assess the hypothesis that “water scarcity induces institutional change,” and identify the conditions for effective institutions for IWRM.

R. Sakthivadivel of IWMI discussed the institutional implications of IWMI’s approach to “water accounting” in river basins. Water accounting takes rainfall as an input, and analyzes flows through the basin, usually including irrigation return flows and groundwater. Basins are assessed in terms of a three-stage model of river-basin development:

1. In the construction-oriented stage, the renewable supply is abundant relative to demand, in “open” basins.
2. During the transitional stage, as more of the available supply is used, management becomes more important, and institutional changes such as irrigation management transfer may be needed.
3. When most water is used, the basin is “closed” in the sense that little water flows to the sea beyond that necessary for preventing saltwater intrusion and preserving habitats. Institutions for water allocation become crucial for good management to prevent pollution, resolve conflicts over water quantity and quality, and deal with other problems such as groundwater overdraft.

In the following presentation, Madar Samad of IWMI outlined the socioeconomic information gathered for evaluation in the five river basins. No single set of institutions could cater to all basins. Instead, institutions must be dynamic, changing with the changing basis of development in the basins and countries.

On Monday afternoon, three advanced basin case studies highlighted lessons from basin management in Australia, Japan and Indonesia:

- A paper on institutional arrangements in the Murray-Darling basin of Australia, written by Darla Hatton MacDonald and Mike Young, was presented by Tissa Bandaragoda. Australian states initiated the formation of the Murray-Darling Commission to address water scarcity and salinization. Stakeholders participate in multiple layers of governance in a pattern of cooperative federalism. Australia has now embarked on major reforms including expansion of water trading and moving toward full cost recovery. Water diversions have been capped and a system of salinity credits established.
- Toru Mase described lessons from the Omonogawa basin in Akita Prefecture, complementing R. Sakthivadivel’s presentation of the paper written by Ian Makin, T. Mase and T. Bandaragoda. Japan’s irrigation water management draws on a long history of local management during which farmers established rules among themselves in a process of self-governance. Any government assistance must be based on requests from the Land Improvement Districts to which farmers belong. Japanese experience indicates that participatory irrigation management (PIM) is more effective if due attention is paid to

the size of farmer groupings and to clear rules for dividing water, thereby facilitating hydrological decentralization.

- A case study of the management of the Brantas basin was presented by Ir. Trie M. Sunaryo of Jasa Tirta I. After construction of major infrastructure in the basin, the Jasa Tirta Public Corporation was established in 1990. Jasa Tirta I manages the major reservoirs, helps control floods, monitors water quality and engages in other activities such as education to improve the river environment. The case study concluded that water resources management should be done in an integrated (multi-sector), comprehensive (upstream and downstream), sustainable and environmentally sound manner. Participation of the public, private and community is essential. The government acts as the owner of the water resources and infrastructure, and Jasa Tirta has a concession to operate major hydraulic infrastructure, while society acts as the water user.

On Tuesday morning, Her Excellency Erna Witoelar, Minister of Regional Settlements and Infrastructure for Indonesia, personally attended the workshop and made a presentation on National Water Resources Policy of Indonesia. The Minister explained Indonesia's reforms in the water resources policy. These are part of national reforms in governance, promoting decentralization and participation. The reforms are intended to set up a national-level policy coordination framework through an apex body, revised water law and regulations and a national water policy. River-basin management will be improved through basin committees with stakeholder participation, basin-level management units in less-developed basins and self-financing corporations in strategically developed basins, secure water allocation through a water rights system and enforceable water pollution control. Public irrigation networks are to be made sustainable through redefining roles of irrigation institutions, management transfer and joint management, autonomous water user associations, and revised financing through user-controlled irrigation fees and government-supported irrigation improvement funds.

Interim findings from IWMI's research in the five basins were presented on Tuesday. The five basins, as it turned out, can be neatly ranked in terms of increasing water scarcity, although this was not part of the original criteria for selecting research sites. Each basin has its own specific issues, but there are many shared concerns:

- The Fuyang basin in China experiences severe water shortage. Groundwater aquifers are being overdrawn. The paper presented by Jinxia Wang discussed the researchers' recommendations to establish water administration bureaus to improve management of water distribution, and to make greater use of economic instruments in water management.
- Irrigation in the Ombilin basin of West Sumatra, Indonesia has been affected by the construction of a hydropower dam upstream that diverts water into another basin. The presentation by Helmi explained that waterwheels had been used to provide continuous irrigation to rice grown on highly porous soils. Even though the amount of water available could still be adequate for the crop, river levels are now too low for many waterwheels to operate properly. Coal washing also generates large amounts of sediment. Basin management institutions have not yet been established, but could be set up under new government policies.

- The East Rapti basin in Nepal is still an open basin in terms of overall water supply and demand. The presenter, K. R. Adhikari explained that since almost all rain falls during 4 months, the basin still experiences seasonal shortages in many locations. Increased diversion conflicts with dry-season flows for the Chitawan National Park downstream. Farmers are making increasing use of groundwater even though they have not responded to government programs for subsidized tube wells.
- In the Philippines' Upper Pampanga river basin, the presentation by Honorato Angeles described how laws, regulations and policies exist to regulate water management, but are not yet fully implemented. The researchers identified a need for better coordinating mechanisms in the basin, as well as better data for water management.
- The Deduru Oya basin in Sri Lanka also experiences seasonal water scarcity in parts of the basin, as discussed in the presentation by K. Jinapala. Much of the middle and tail parts of the basin lacks water in the dry season, though some farmers pump directly from the river. Drinking water is a major problem since groundwater in two-thirds of the basin is not suitable for drinking. There are not yet any institutions capable of coordinating water use in the basin in an integrated manner.

The brief synthesis of the five basin studies, presented by Randolph Barker of IWMI, emphasized the three major stages in basin development. Greater attention is needed to the historical development of institutions. All sites reported a need for reliable data, inadequate planning, absence of well-defined water rights and absence of mechanisms for integrating surface water and groundwater use. There were various site-specific problems, but all basins suffered from seasonal water shortages. The researchers have made recommendations for solving problems in basin management, and the workshop will also formulate action plans concerning how institutional changes could respond to these problems.

Field Visits

- On Tuesday evening, workshop participants visited the Jasa Tirta headquarters, listened to a briefing on organization, observed the control room used for monitoring of water levels, flood management and other activities and then had dinner.
- On Wednesday morning, participants began the day by traveling to the headwaters of the Brantas river and planting a tree in the Jasa Tirta Arboretum. They then visited several reservoirs on the upper Brantas river, learning how the reservoirs were built and how PJT has responded to problems such as high levels of volcanic sediment entering the watershed.

On Thursday morning, IFPRI researchers presented papers on their current research. The modeling approach being applied by IFPRI offers a tool for assessing possible changes in water management institutions through integrated analysis of hydrological and economic systems.

- The paper presented by Charles Rodgers described the basin, earlier studies and the approach used in the current study. Integrated modeling provides a mathematical representation of how water flows through the network, and how water is used in response

to economic costs and benefits, as influenced by various management arrangements. The Brantas model is initially being developed in a simplified form, to check its consistency with current hydrological models, and it will then be extended to allow analysis of possible changes in management.

- The paper presented by Claudia Ringler on the Dong Nai basin in Vietnam, presented by Nguyen ChiCong, described Vietnam's water laws and other recent changes in national water policies, development of the Dong Nai basin, the challenges of increasing industrial and urban demand and plans for the formation of river basin management institutions. Integrated modeling could assist policymakers to develop efficient, equitable and sustainable strategies for water allocation.

On Thursday, participants from Thailand, Laos, Vietnam and Cambodia, though not directly involved in the two studies, and who attended the workshop as observers, described water resources management in their countries.

- In Thailand, the National Water Resources Committee and the Office of the National Water Resources Committee were established in 1996 to provide an apex body for the sector. River basin committees are being established in subbasins, such as the upper and lower Ping, as flexible pilot efforts on a participatory bottom-up basis to support the eventual establishment of a Chao Phraya Basin Organization. A new water law is under preparation, which should take account of current government policies for decentralization.
- In 1996, the Lao Peoples Democratic Republic enacted a Water and Water Resources Law. A national Water Resources Coordination Committee and its Secretariat were then established. They have prepared a Water Sector Strategy and Action Plan. Following up on its support to these efforts, the ADB is now assisting in the preparation of an integrated approach for the management and development of the Num Ngum river basin.
- Vietnam's recent Law on Water Resources assigns overall responsibility to the Ministry of Agriculture and Rural Development, but bylaws, regulations and enforcement need further action. A national water resources council is to be established. Preparations have been made to establish an RBO for the Red river.
- Cambodia recently established a Ministry of Water Resources and Meteorology. A law on water resources has been drafted. The draft would allow free use for drinking, washing and other domestic purposes, but makes other uses subject to licensing. In irrigated agriculture, the government policy is to devolve responsibility for all aspects of irrigation scheme operation to Farmer Water User Committees.

On Friday morning, two special papers were presented on water policy development in Sri Lanka and integrated water resources management in Malaysia.

- M. Wickremage, Director of the Sri Lanka Water Resources Secretariat explained how in Sri Lanka, a comprehensive program for integrated management of water resources was initiated in 1990. A temporary Water Resources Council and Secretariat were established in 1996. The Council includes representatives from academia, the private sector, NGOs,

FOs and a gender representative. The policy development process has featured extensive stakeholder consultation, but further dissemination and communication are needed with those who have not taken part in consultation meetings. In late 2000, a separate ministry was established for Water Resources Management and Irrigation. A Water Resources Act has been drafted which would result in the formation of a National Water Resources Authority.

- Salmah Zakaria, Director, Water Resources Planning of Malaysian Irrigation Department, stated that Malaysia had taken initiatives for IWRM and IRBM. Land and water are state matters in Malaysia's federal system, but at the national level there is a National Flood Commission and a National Water Resources Council. Water management faces challenges from rapid economic growth, urbanization, industrialization and increasing sensitivity about environmental issues. Irrigation operators are corporatized entities. Three states have river basin committees and one has a basin authority. National consultation on IWRM/IRBM has involved public agencies, environmental and consumer NGOs and others. Immediate needs concern improving public awareness, building institutional capacity and networking among stakeholders. In the longer term there are needs for review of legislation, better enforcement, more RBOs, infrastructural improvements, preventive measures, planning, public participation and appropriate financing arrangements.

On Thursday afternoon, participants were divided into six groups. Initial action plans were formulated for the five countries involved in IWMI's study. Those involved in the IFPRI studies in Vietnam and Indonesia spent time learning about each other's activities, analyzed the differences between the basins and discussed opportunities for further collaboration between IFPRI and IWMI.

- The action plan for Indonesia made short-term recommendations that management in the Ombilin basin be discussed in the province, that persons from Jasa Tirta give briefings on management in the Brantas basin, that key decision makers visit Brantas, and that provincial policy and regulations be drafted, with public consultation, and then submitted to the provincial parliament. In the mid-term over the next 5 years, a provincial water resources committee should be established, information systems developed and a basin-level committee prepared for the Ombilin basin.
- The action plan for Sri Lanka stressed the need for an integrated approach to the basin, additional studies of river management and water quality, educational efforts and institutional changes.
- The action plan for the Philippines recommended dealing with water shortage with more storage, efficient and equitable management, and watershed conservation. Deterioration of irrigation facilities should be addressed by the introduction of selective subsidies, increased irrigation service fees and adjustments of collection incentives, strengthening of IAs and reorganization of the National Irrigation Administration. Better enforcement and more measurement were needed to improve water quality. IWRM should be developed through better coordination, but since allocation problems are not urgent, basin planning was not felt to be a pressing issue.

- The action plan for Nepal covered the need for better institutions at the national level and basin-level efforts for water allocation, appropriate groundwater development and watershed conservation.

Views of the Concluding Panel

On Friday morning, panelists briefly proposed their main recommendations on the topics covered by the workshop:

1. Integrating diagnosis of institutional reforms in the short and long term with economic and hydrological analysis and best practices.
2. Clarifying and assessing water-resources problems and issues thoroughly before formulating IWRM strategies and actions.
3. Considering institutional sustainability, from the viewpoints of owners, operators and users of water facilities, with coordination and guidance from a national apex body.
4. Strengthening capacity through human resources development programs that address technical, economic, social and political issues.
5. Cooperation among water users to develop arrangements to share scarce water resources.
6. Establishing an appropriate balance between centralized arrangements for IRBM and decentralized arrangements for water allocation based on water rights and economic incentives.
7. Generating local and private-sector investments, involving the nonagriculture sector and applying pricing mechanisms that encourage water conservation.
8. Recognizing the effectiveness of a strategy that, like Jasa Tirta's, promotes a single objective, expands tasks incrementally, invests heavily on staff, manages existing water infrastructure, establishes financial sustainability through cost recovery, maintains long-term technical assistance partnerships and pursues the highest standards.

The active discussion following the panelists' presentations noted the importance of water rights, participation, need for additional information on institutional strategies in agricultural water use, poverty and water conservation. The action plans identified during the workshop would need to be developed further in consultation with stakeholders.

Annex 8

Joint Statement by the Ministerial Delegations of Ten Asian Nations, United Nations Conference Centre, Bangkok, May 22-23, 2002

Involving the nations of Cambodia, Indonesia, Lao PDR, Malaysia, Myanmar, Nepal, Philippines, Sri Lanka, Thailand and Vietnam.

Final Version

1. We, the ministerial delegations of the above ten nations of Asia, hereby issue this joint statement of common concerns, shared principles and agreed priorities for action about water and sustainable development, a subject which is of vital importance to our countries.

Common Concerns

2. We have duly noted, with concern, the water-related problems affecting the peoples and environment of Asia. The following list summarizes our key concerns:
 - a. Recurring water shortages and droughts.
 - b. Recurring flooding and inundation of lands and settlements.
 - c. Lack of access to safe and affordable drinking water and sanitation facilities for all and especially for the poor.
 - d. Degradation of the environment in catchment and downstream areas.
 - e. Increasing water pollution.
 - f. Shortage of funds for water infrastructural development and management.
 - g. Need to enhance the socioeconomic value of water, especially to realize its potential for food production, employment generation and poverty reduction.
 - h. Need for optimum utilization of water in river basins.
 - i. Lack of institutional development, capacity building and public awareness.

Shared Principles

3. We acknowledge that the above concerns are serious enough to merit commitment by our nations to the following basic principles. Water is essential for all living beings. We believe that water for drinking and sanitation, for supporting basic livelihoods, and for food security and health is a basic human need and should be given the highest priority by our nations. We believe that water should be given special social valuation for uses for basic human needs. Governments should ensure that all people have affordable access to safe water for basic human needs. We also believe that water should be given an economic valuation for competing economic uses.
4. Food security should be ensured through advancements in the efficiency, equity and productivity of water used for agriculture. Knowledge and technology in such areas should be made more accessible and affordable. The fragile ecosystems of watersheds, river basins and wetlands are essential for our quality of life and should be protected through sustainable land and water management practices. In the future, economic incentives and sanctions should play a larger role in water allocation and protection of water quality.
5. We support the active participation of water users and all stakeholders in representative forums for planning, development and management of water resources. Water resources should be developed and managed in an integrated, multi-sectoral, transparent and sustainable manner within the context of river basins. We believe that good governance of water resources requires openness of information about water supplies and demands, accountability of public agencies, subsidiarity in decision making, community empowerment, and the rule of law and formal agreements. Government investments in development and maintenance of community-level water infrastructure and management should be designed in ways that stimulate local investment and promote self-reliance of water user communities.

Priorities for Action

Regional Cooperation

6. Although conditions in each country are different, our countries face a similar set of basic challenges. Therefore, we encourage cooperation among our countries in various forms, including exchange of information and expertise, workshops and seminars, comparative research, exchange visits to observe innovations, training and capacity building.
7. We believe that our countries would benefit significantly from regional cooperation on the following priorities:
 - a. Information about new technologies, management methods, and best practices in IWRM (including conflict management).
 - b. Development of RBOs and networking between them in the region.

- c. Information sharing on climatic variability and forecasting extreme weather conditions.
- d. Policy, legislation, water rights and riparian issues.
- e. Financing water-sector facilities and services.
- f. Cooperation in developing private-sector participation in provision of water services.
- g. Regional water assessment program.
- h. Agreements for and management of international rivers.
- i. Determining water requirements for environmental uses.
- j. Sources of credit for irrigated agriculture.

***Water Priorities in Asia That We Wish to Bring to the Attention of
Future Global Forums on Water Resources***

- 8. In anticipation of the forthcoming World Summit for Sustainable Development, the Third World Water Forum, and other international forums on water, we request international attention about and action on the following matters that are of special importance to Asia:
 - a. The need for more investment in the development of infrastructure for irrigation, drainage, hydropower, water supply, sanitation, water treatment and flood mitigation.
 - b. The need to reduce water pollution, protect catchment areas and other fragile ecosystems.
 - c. Sustainable development and management of wetlands.
 - d. The need to mobilize funding for water resources development and management from local communities, governments and other sources.
 - e. The need to find and apply measures to mitigate harm caused by water-related problems, such as flooding, drought, pollution and diseases.
 - f. Institutional development and capacity building for IWRM (including administration of water rights, decentralization and irrigation sector reform).
 - g. Means to maximize productivity and social and economic benefits from water resources.