

WATER FIGURES ASIA

NEWS OF IWMI'S WORK IN ASIA

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ISSUE 1 2006

TURNING RESEARCH INTO DEVELOPMENT



EDITORIAL

WATER FIGURES ASIA ISSUE 1 JUNE 2006



WELCOME TO WATER FIGURES ASIA.

This is the first newsletter from the “new” Asia Region and is intended to communicate news and information on IWMI's projects and partners in Asia.

While I refer to this as a new region, as many of you will already know, IWMI has over two decades of history in Asia, and this region was formed by aggregating our operations and activities in South East, South and Central Asia. In August 2005, I became the Director of the Asia Region,

Reflecting the emphasis over the past five years to locate more of our researchers closer to our partners, almost one third of our staff is now based in Asian countries other than Sri Lanka. In fact, our Central Asia office in Tashkent and our IWMI-Tata office in Anand in India, recently celebrate their five year anniversaries.

The size and complexity of the region, the different levels of local expertise and knowledge, and the significant on-going changes in many of the countries we work in, has meant that we are undertaking our research in a rich contextual environment. In South Asia, the inspiring economic developments of recent years present new opportunities for improving the productivity of water and land resources and reducing poverty. Yet, it also presents further challenges to ensure that the demand for these resources does not further exacerbate poverty and environmental degradation. It is estimated that in India alone, approximately 250 million people live on less than a dollar a day. While the proportion of the population living in rural areas in India is expected to decline, the absolute number is projected to continue to increase. This will require that more be done with less, at least with regards to water resources. Our activities in the Krishna river basin, our benchmark basin in India, are summarized in this newsletter.

Conditions and challenges are quite different in Central Asia. Land, water and environmental degradation, combined with the near collapse of many of the former Soviet institutions, are major constraints. Yet, a resurgent agricultural sector has the potential to offer livelihood opportunities for the rural communities. IWMI's work in this sub-region is focused on improving the management of degraded land and water resources, and on recreating the necessary institutional arrangements to manage water resources. Two of our major projects in Central Asia, one on improving water management institutions and the other on reversing the land degradation, are included in this newsletter.

In South East Asia too, economic improvements and other factors mean that partners are progressively more interested



in applying their expertise outside their own country. Our efforts in this sub-region are increasingly focused within our benchmark basin, the Mekong, where our main strategic focus is on degraded lands and water resources, the environment and agricultural interactions, and the water management institutions. To this end, we have relocated our sub-regional office to the WorldFish headquarters in Penang. In addition, we have been strengthening our presence in Cambodia, having recently established a country office, which is also co-located with WorldFish in Phnom Penh.

One of our long-running partnerships in the Mekong region is the Management of Soil Erosion Consortium (MSEC) with IRD (‘<http://www.ird.fr/us/>’ Institut de recherche pour le développement). The main feature for this issue highlights a project that was implemented within this program. ‘Understanding farmers’ strategies and land use change in the northern uplands of Vietnam’ is written by Floriane Clement, an international research fellow with IRD-IWMI who worked with the MSEC project in Vietnam. She writes that a combination of local factors played a more significant role in getting farmers onboard a reforestation program than the incentives given to them to participate as part of national policy. Additionally, the extent to which households can access information and credit has determined land use allocation and exacerbated social inequities. These are issues that IWMI's research and Water Figures Asia will continue to highlight.

Peter McCornick
Asia Director
IWMI

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Livelihood impacts of water policy changes: evidence from a coastal area of the Mekong River Delta

CHU THAI HOANH

Photo Credit Chu Thai Hoanh | Temporary dam built by local people to separate fresh water and saline water in the dry season



Increased shrimp production in the Mekong delta of Vietnam has led to conflict over access to water between rice farmers and fishers. On the one hand, farmers require fresh water for the production of rice in the dry season, while on the other, shrimp farmers require brackish water during this low-flow period. In order to expand the fresh water zone for rice production, the Government has built dams and sluices in the Ca Mau Peninsula to prevent the movement of much needed brackish water that is critical in the production of shrimp. This conflict is best exemplified in Bac Lieu Province when in 2001 shrimp farmers destroyed a major diversion to allow the movement of brackish water upstream to service their production systems.

With support from DfID, a collaborative project between the International Rice Research Institute (IRRI), WorldFish and IWMI was initiated to establish viable options that would accelerate poverty elimination through sustainable resource management in coastal lands and address the conflict between rice and shrimp farmers. Through a participatory process between farmers, fishers, water managers, and local and provincial

authorities, a land use zoning map was developed and agreed upon by all parties, along with a sluice gate operation protocol based on modeling scenarios to regulate salinity in the river and canal systems. Water managers and provincial authorities have adopted these guidelines and management recommendations to manage the conflicting demands for water between the two different interest groups by providing suitable quality water to rice farmers in the eastern part whilst keeping the western part dedicated to shrimp production.

Surveys undertaken during 2000 to 2005 have shown that, as a result of a more structured approach to the management of water in the area, fishery production has been significantly improved. The annual per capita GDP of approximately 800 thousand people in Bac Lieu province has increased from US\$ 248 to US\$ 648. In addition, the income of the poor communities living on acid sulphate soil areas has increased threefold, and there have been no conflicts between the two water user groups since 2002.

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Understanding farmers' strategies and land use change in the Northern Uplands of Vietnam

FLORIANE CLEMENT



June 2001 | Fields of cassava | Photo Credit Didier Orange



June 2004 | In the centre, field of fodder Bracharia (in light green) and agroforestry (Acacia) | Photo Credit Didier Orange

Over the past two decades, Vietnam has undergone significant changes with respect to land reforms that have had impact on land use systems throughout the country. Farmers have shifted from collectivised agricultural systems managed by cooperatives to household farm systems that are governed by individual decision-making. Land tenure changes and economic liberalization has led to increases in agricultural productivity and poverty reduction. In the uplands however, economic development has been slow and communities still face periodic food shortages. Hence, rural development in the uplands has been considered as a critical issue by policymakers, donors and non-governmental organisations (NGOs). Government concern has been reflected in a series of policies specifically directed towards mountainous regions including settlement programs, reforestation projects and forest land allocation to individual households. One objective was to improve or substitute supposedly backward traditional land use systems of ethnic minorities living in the uplands. A second objective was to protect existing forests and “re-green” barren hills to promote watershed and land protection. But the success of these initiatives both in improving livelihoods and providing environmental benefits is being challenged.

Stemming from the recognition of these shortcomings, a research project was initiated with the specific aims to: assess the extent to which national policies have actually impacted on land use and livelihoods; and to examine the gap between policymakers' intentions and land use change in the northern uplands of Vietnam.

THE STUDY COMPRISES THREE DISTINCT LEVELS:

The household and village level with an interest in individual and community decision-making processes. The framework used to analyze data is the Institutional Analysis and Development (IAD) Framework initially proposed by Kiser and Ostrom, coupled with an historical perspective;

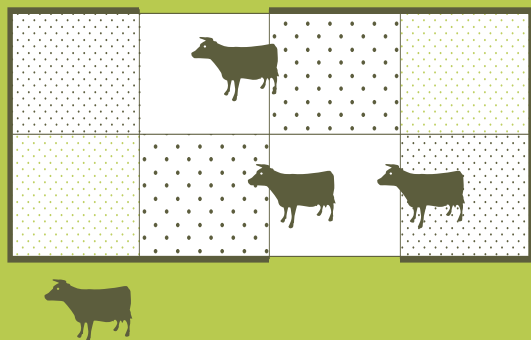
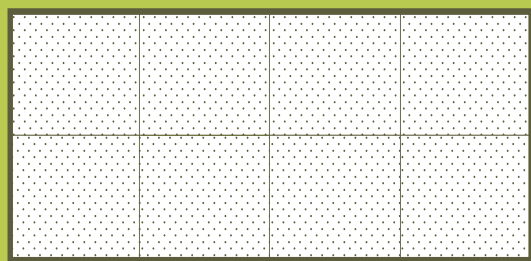
The district and province level, with a focus on the influence of meso-scale factors on land use. The methodology for analysis will rely on Geographical Information System (GIS) and spatial quantitative data analysis;

The national level, with a focus on understanding the driving forces for policy changes with an emphasis on the influence of research. A policy process analysis drawn from Keeley and Scoones approach will be carried out to identify the relative importance of stakeholders groups, influential actors and prevailing beliefs on policy making.

THE OVERALL GOALS OF THE RESEARCH PROJECT ARE TO GUIDE:

national decision-makers in policy design by providing in-depth insights into linkages and causality relationships between environmental, economic, social, institutional incentives and farmers' land use strategies;

researchers in communicating scientific results effectively by supplying a dynamic analysis of policy changes in the sector of rural development in Vietnam.



Annual Cropping



Trees Plantations/Fallow



Fallow/Grazing Land

AN INSTITUTIONAL ANALYSIS OF LAND USE CHANGE

Situation 1 | From the early 70s, farmers started practising shifting cultivation (dominant cultivated crops were cassava, arrow-root, taro and maize) in the uplands, with cultivation periods of 2-3 years and fallow periods of approximately 15 years.

Farmers adopted collective institutional arrangements to conciliate grazing and cultivation activities in the uplands. They grouped together their fields and built fences collectively to protect them from free grazing cows and buffaloes. Costs to prevent cattle from entering the fields were also reduced through these collective rules as one farmer could watch all of the neighbours' fields when working on his own field. In addition, even if animals entered the protected area and caused damage to the crop, this damage was effectively shared between the fields and land owners.

Situation 2 | Land was allocated in the mid 90s. Towards the end of the decade, since soil fertility had declined, some farmers decided to stop annual cropping. This decision taken by a few field owners had a significant impact on the whole concept of collective rules. Farmers who stopped cultivating, either let land lie fallow or planted trees through government programmes, no longer needing to prevent cows and buffaloes from entering their plot. Neighbouring fields were damaged. Costs to protect one's field increased, as land owners had to build individual fences around their fields. As a result of land allocation, farmers could not move their fields. Moreover, they progressively stopped cultivating annual crops, as the costs of protecting one's field were higher than the expected benefits from crop sales.

The local level analysis is now completed. It involved several weeks of fieldwork in three different villages and more than 80 households in a commune of Hoa Binh province, including focus group discussions, participant observations and interviews with local authorities.

AN ILLUSTRATION OF LAND-USE CHANGE IN THE CASE STUDY AREA: FROM ANNUAL CROPPING IN THE 80S-90S TO TREES PLANTATIONS TODAY

Research results revealed that the relative success of the reforestation program promoted through national incentives was more the consequence of a myriad of local factors than national policy. Firstly, it was found that farmers didn't stop cultivating annual crops in the uplands in order to plant trees but because of the collapse of institutional arrangements governing grazing and cultivation cohabitation (see Box 1). Farmers chose to plant acacias and eucalyptus as a last resort because there was no other option available. Secondly, focus group discussions with farmers suggested that tree plantations were only economically profitable for the richest farmers. As the environmental benefits of these monocultures associated with tree plantations have been repeatedly questioned by scientists, one can thus speculate why these ambitious programs promoting monoculture tree plantations have sustained and have greatly attracted donors' funding and NGOs' interest.

The study also suggested that because of differentiated access to information and credit, allocation of land use rights for households has sharpened social inequities. In addition, con-

flicts over fuelwood collection and grazing activities have arisen within the villages. This phenomenon was further enhanced by urbanization and the subsequent interest of Hanoians in land use rights in this area.

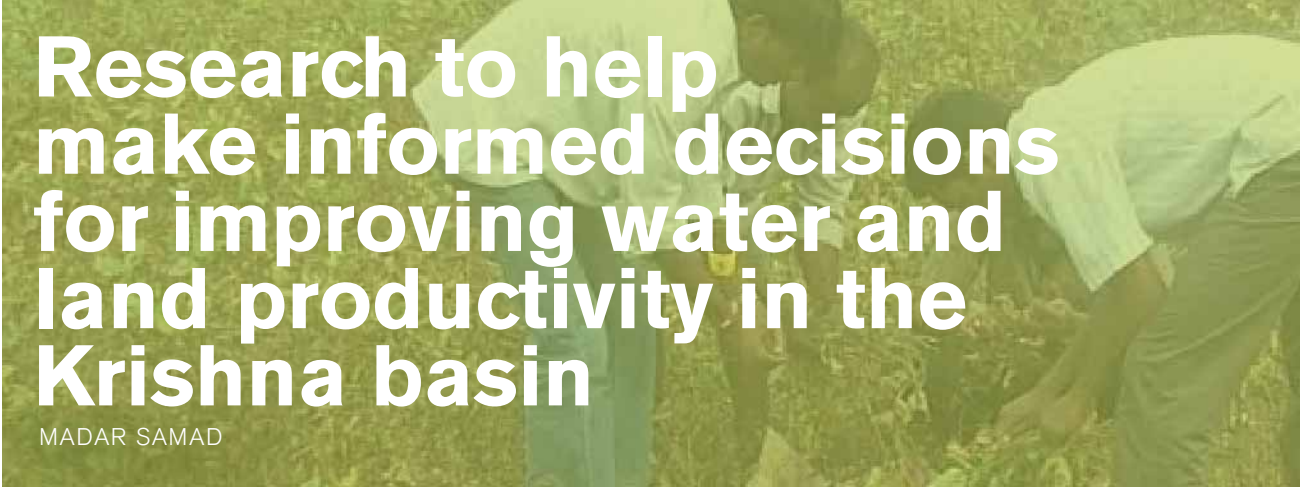
Finally, the research underlines the importance of qualitative and local studies. Macro factors alone did not provide a true explanation of land use change. Individual and community decisions in the study area were found to be dependent on local factors such as biophysical attributes and community rules for land management.

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About the author

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Research to help make informed decisions for improving water and land productivity in the Krishna basin

MADAR SAMAD

Photo Credit G. Murali Krishna

The Krishna River basin in India, covering an area of 258,000 km, is one of IWMI's benchmark basins. It has a combined population of 67 million and is spread across three large southern states—Karnataka, Maharashtra, Andhra Pradesh. It is one of India's largest domestic waterways and supplies water to important food production areas including the "Rice Bowl" region in the Krishna delta. Water extractions for agriculture, industry, and domestic uses from the Krishna continue to grow to support one of the fastest developing regions of peninsular India. Rapid urbanization in the basin also makes demands on water supplies, resulting in adverse social, economic and environmental impacts. As the three states share the shrinking water resource, basin closure has resulted in interstate water conflicts.

IWMI's research in the Krishna River Basin will present important lessons for the effective management of water resources in water scarce basins. It is expected to help policymakers in the three riparian states of the Krishna basins make informed policy decisions to enhance water and land productivity in the basin. It also aims to help improve the livelihoods of poor people who live and work in the basin.

Five major IWMI-led projects are at work in and around the Krishna Basin.

◊ Management Scenarios to Improve Water Productivity

is a collaborative study between IWMI, University of Melbourne and Jawaharlal Nehru Technological University, Andhra Pradesh. The study will assess water and land productivity at basin level for key crops at spatially disaggregated levels across the basin, analyze the key variables that explain water productivity variations, and determine opportunities to improve aggregate water productivity at a sub-basin scale, particularly in agriculture, livestock and fisheries systems.

◊ **Remote Sensing for Basin Management.** IWMI is developing innovative methods and techniques using advanced satellite sensor data in mapping irrigated areas in South Asia at various scales and pixel resolutions. The free availability of high quality data on the internet for public access will help manage water for food and environmental security. The maps and its related products include area estimates, crop calendars and their dynamics—derived for each characteristic agricultural system around South Asia.

◊ Mapping Water-Land-Poverty Nexus in the Lower Krishna Basin.

In many water-stressed basins in developing countries, a large number of people do not have access to water of sufficient quality and quantity to satisfy basic needs. Although, as basins close, many processes that perpetuate poverty come into play, there is clear evidence that access to water and land are crucial for poor people to build sustainable livelihoods.

This study analyzes the links between spatial variations of poverty in the river basin and access to water and land resources. Its specific objectives are to generate reliable statistical and cartographic products for mapping poverty and food insecurity. The study is being carried out in collaboration with the Command Area Development Authority of the Government of Andhra Pradesh and VISTA, an NGO based in Andhra Pradesh.

◊ **Wastewater for irrigation.** Wastewater agriculture in the urban area along the Musi River provides livelihoods to a diverse group of people in and around Hyderabad. The use of wastewater in fodder and vegetable cropping systems has shown to be beneficial for farmers. Wastewater is a reliable water source and has high nutrient value; these two factors combined may result in considerable savings in inputs, translating into higher incomes. Based on a combination of field and laboratory studies and structured interactions with producers, consumers, and authorities (urban planning, public health and water management) the project will develop a set of technically feasible, socio-economically sensitive, and institutionally sustainable risk mitigation options to improve health and safeguard wastewater-dependent livelihoods of poor urban and peri-urban farmers.

◊ **Institutional adjustments and political geography of water availability and uses** examines the regional pattern of agriculture and water use development in the Krishna basin since the 1850s in the general framework of river basin trajectories. This study first identifies the drivers of the current closure of the Krishna basin to better understand it. It then examines patterns of past and current contextual factors that impinge on water availability and uses in the Krishna river basin to understand the extent to which contemporary formal and informal institutional arrangements and agrarian dynamics, consistency or mismatch at different scales, reflect/affect water resources geography, availability, allocation and uses. ◊

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VASAT – Using ICT for Better Water Management

Dry, parched and rocky is what best describes the Addakal mandal, a cluster of villages 150 km from Hyderabad. Farmer suicides have been rampant in the region due to dwindling finances caused by drought-related crop failure. The Virtual Academy for the Semi-Arid Tropics (VASAT) coalition was set up as a pilot project to address the issue of the 'lack of information', identified as a factor in the farmer suicides. Soon, Addakal became an information hub to help poor rural farmers cope with drought.

The coalition is led by the International Crops Research Institute for the Semi-Arid Tropics (ICRISAT). Key partners are IWMI and the International Livestock Research Institute (ILRI). The project is supported by the ICT-KM program of the Consultative Group on International Agricultural Research (CGIAR).

For the past two years, VASAT has been helping vulnerable rural communities to collectively identify problems, articulate their needs and take up informed action in relation to drought preparedness. This has been achieved by creating demand-driven content that can be easily accessed, understood and applied by rural stakeholders. Need-based content developed with partners can then be accessed and adapted by local partners, intermediaries and rural farm communities.

IWMI is contributing to the information repository by contributing Water Management content for a technology-mediated paradigm based on open distance learning for extension education. The courses include water scarcity, urban rainwater harvesting, rural rainwater harvesting and conservation of irrigated water in agriculture. All the courses can be accessed on the VASAT website. IWMI researchers are involved as subject experts to review and authorize dissemination of content, including content developed by other partners. One such example was the Coping with Drought module developed by ICRISAT. An ongoing discussion is helping to consolidate all Drought Monitoring software created by IWMI researchers and place them in the public domain. IWMI also supports VASAT's researchers who are assessing different Learning Management Systems to create locally relevant extension materials and support farmer-expert interactions.

CECILIA ABRAHAM



Photo Credit: G. Dileep Kumar

Enabling Communities in the Aral Sea Basin to combat Water and Land Degradation through 'Bright Spots'

Overexploitation of water and soil resources, with concomitant desertification of the Aral Sea and damage to the delta systems in the region has resulted in serious economic, social and environmental consequences. In Central Asia, crop yield losses have exceeded 30%. Nearly half (47.5%) of the irrigated land is affected by salinization—ranging from 11.5% in Kyrgyzstan to 95.9% in Turkmenistan. And declining agronomic productivity has contributed to the development of endemic poverty in rural agrarian communities in the region. The region faces enormous challenges in preventing, mitigating and reversing the processes of soil and water resources degradation. Yet, there is cause for optimism.

There are communities and individuals who have managed to keep the resource degradation in predominantly degraded areas at a sustainable level, while ensuring secure livelihoods. 'Bright Spots' are the areas where land degradation and low productivity are successfully averted by local farmers through their own initiatives and best practices. An IWMI-led, ADB funded project 'Enabling farming communities in the Aral Sea basin to reverse water and land degradation by the creation of 'Bright Spots' was launched in 2005 in Kazakhstan, Turkmenistan and Uzbekistan. Partners include International Center for Agricultural Research in the Dry Areas (ICARDA) and International Centre for Biosaline Agriculture (ICBA).

The Bright Spots project promotes and supports community-based innovations whilst increasing profits at the farm level. For example, individual farmers or shirkats have developed coping strategies that include simple changes in farming practices such as ensuring timely agricultural operations, using organic soil amendments, maintaining water infrastructure on farm, and use of waste lands for crop diversification. These practices combined with innovative coping strategies to enhance cash flow, have resulted in higher crop yields, increased profitability, and improvement in resource conditions on farms.

The project aims to address poverty, improve food security at household level and enhance environmental security through the development, promotion and adoption of strategies that enhance the productivity of existing irrigated farming systems in Central Asia. Work is carried out in cooperation with partners and the Ministry of Agriculture of Kazakhstan and its Water Resources Management Institute; the Ministry of Agriculture of Turkmenistan and its Land Management and Resources Department; and the Ministry of Agriculture and Water Resources of Uzbekistan and its National Agricultural Research Center. At present, between 8 and 11 'bright spots' have been successfully identified in each of the project countries.

ANDREW NOBLE AND MURAT YABUKOV

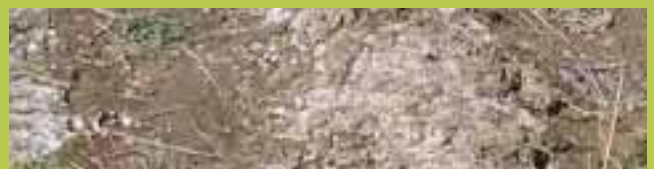


Photo Credit: Iskandar Abdullaev

For further information on IWMI's work in Central Asia visit: <http://www.iwmi.cgiar.org/centralasia/html/>



IWRM makes an impact in the Ferghana Valley

IWMI's successful Integrated Water Resources Management Project in the Ferghana Valley is now in its third phase. It's an action research project—located in Kyrgyzstan, Tajikistan and Uzbekistan—funded by the Swiss Development Cooperation and jointly implemented by IWMI and its regional partner in Central Asia, the Scientific Information Center of the Interstate Commission for Water Coordination (SIC-ICWC).

In its first two phases, the project developed, tested and adopted major approaches, frameworks and methodologies. It is currently set to consolidate, improve and up-scale these achievements. Overall, the project aims to improve the effectiveness of water resources management in the Ferghana Valley by promoting institutional reforms in accordance with the Integrated Water Resources Management principles. It addresses the key issues related to water distribution and public participation in all levels of the water management hierarchy—from tertiary (informal user groups) to secondary (formal user associations) to main canal levels (public-government partnerships) while making links to national policy.

An important project result was the development and presentation of the IWRM conceptual framework for the project countries. This includes considerations of hydrological boundaries, public participation and democratic management. As a result, the IWRM concept was agreed upon and approved by the ministries responsible for water management in the three countries.

Another important result was the development of a comprehensive social mobilization approach to establish Water User Associations (WUAs). A training module for social mobilization and institutional development at WUA and main canal levels was produced. Regular training workshops and socioeconomic surveys organized by the project provide new opportunities for widest involvement of those who have any stakes in the water sector reforms in the countries of the Ferghana Valley. The project is facilitating the continuous creation of new WUAs along the three main pilot canals—Aravan-Akbura Canal in Kyrgyzstan, the Khoja-Bakirgan Canal in Tajikistan and South Ferghana Canal in Uzbekistan.

The project partners and stakeholders also worked to define and discuss alternative organizational structures of water management at WUAs and main canal levels. Based on these discussions and agreements, the water and land management ministries of Uzbeki-

stan, Tajikistan and Kyrgyzstan agreed to establish unified 'Canal Management Organizations' (CMOs) along the three pilot canals. The management of the canals used to be divided between and managed by several districts and provinces in their corresponding countries.

An external review mission organized by SDC at the end of the Phase II carried out a comprehensive independent auditing of the project and came up with a positive assessment. It made particular reference to the following: "The development of Canal Management Organizations and Canal Water Committees as executive and governing bodies at the main canal level is one of the most innovative and unique element of the project not covered elsewhere by anybody else, which should be better secured in legislative domain and in dialogue with institutions."

A massive social mobilization campaign was launched to identify and involve all the key stakeholders in the governance of these canals (water users, local governments, water management organizations, NGOs, industries etc.) in the setting up of joint public governing bodies. This again was an important water management innovation introduced in the region by the project. Although the status and mandate of these public governing bodies are still under discussion, it puts the principle of user participation one step higher in the water resources management hierarchy than the secondary canal level where community-based WUAs are established. These public bodies initially established as Canal Water Committees have been presently transformed into Unions of Canal Water Users (UCWU) and are being further refined in the third phase.

With regard to national legislations, it was clear that the current legal frameworks in the countries of the region do not enable the required changes to take place in the water sector. With this in mind, the project has developed and disseminated recommendations among its national partners for changes to be made in the national laws. The project plans to publish policy briefs to mobilize support for legal and regulatory changes at the highest national policy level.

One of the major impacts in the region that can be attributed to the project was the decision by the Uzbek Government in July, 2003 to restructure and realign its entire water management system along hydraulic boundaries by issuing a special decree 'On reforming water management'.

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