




Canadian International
Development Agency
Agence canadienne de
développement international



**DEVELOPING HUMAN AND
INSTITUTIONAL CAPACITY
IN TRANSBOUNDARY WATER MANAGEMENT
THROUGH**

**WATER RESOURCES TRAINING
NETWORK**

(Case Study in the Aral Sea basin, Central Asia)

Tashkent - 2006

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ACRONYMS

ADB	Asian Development Bank
AIA	Advanced Irrigated Agriculture
BWO	Basin Water Organization
CAR	Central Asian Republics
CEA	Canadian Executing Agency
CIDA	Canadian International Development Agency
CIK	Contribution In Kind
CWB	Canal Water Board
DFID-UK	The Department for International Development – United Kingdom
IFAS	International Fund for Aral Sea
FAO	Food and Agriculture Organization
EU	European Union
GEF	Global Environment Facility
GIS	Geographic Information System
GWP	Global Water Partnership
GWP CACENA	GWP Central Asia and Caucasus
ICID	International Commission on Irrigation and Drainage
ICSD	International Commission for Sustainable Development
ICWC	Interstate Coordination Water Commission
IWMI	International Water Management Institute
IWRM	Integrated Water Resource Management
MAW	Ministry of Agriculture and Water
NGO	Non-Governmental Organization
NRMP	Natural Resources Management Project
PMF	Project Measurement Framework
PPF	Project Planning or Performance Framework
PPR	(Annual) Project Performance Report
PRT	Project Review Team
RBM	Results Based Management
SDC	Swiss Development and Cooperation Agency

SIC	Scientific Information Centre
SPA SANIRI	Scientific Production Association Central Asian Research Institute of Irrigation
TACIS	Technical Assistance (of the EU) for Commonwealth of Independent States
TC	Training Centre
TL	Team Leader
UNDP	United Nations Development Program
UNEC	United Nations Economic Commission for Europe
UNEP	United Nations Environmental Program
UNFCCC	United Nations Framework Convention on Climate Change
USAID	United States Agency for International Development
WB	World Bank
WUFMAS	Water Use and Farm Management Survey
WUA/FWUA	Water User Association/Water Users Federations

ACKNOWLEDGEMENTS

The purpose of this paper is to add a strong voice to the clear message going worldwide that calls for a transition from advocacy to action – a message reinforced by a series of recent World Water Forums. The essence of this paper is to review a case study founded on a new spirit of long-term regional cooperation facilitated by international support. This paper also serves as a “meeting point” for practitioners committed to establishing - *Integrated Water Resources Management (IWRM)* principles (as promoted by GWP); more specifically - the importance of training to implement IWRM.

This paper brings together the “corporate view” - shared by a group of international, regional (the Aral Sea basin) and national experts from Central Asian states in the field of irrigated agriculture - on the significance, implications and means to provide adequate training to water users and water managers. Consideration is also given to the alignment of the training with conditions of a rapidly changing socio-political environment and transition of Central Asian states to a market economy. The before mentioned experts have all played a part in laying the foundation for developing multidisciplinary training the region. Training activities were implemented under the five-year CIDA (Canadian International Development Agency) project entitled “Water Resources Management Training Project in Central Asia”.

The CIDA Training Project started in April 2000 and was completed in December 2005.. This paper includes assessments from reports provided by the Project Review Team (PRT) submitted to CIDA, as well as opinions of key actors of the Project. The Canadian team was led by Dr. **Chandra Madramootoo** (Dean of the Faculty of Agricultural and Environmental Sciences, **McGill University (Canada)**), Dr. Madramootoo provided insight, direction and analysis critical for the successful completion of this project.

This paper includes contributions by ICWC members, professional ICWC-support staff and enthusiastic moderators and lecturers from the five Central Asian countries – all key players in the establishment of the Training Network in the region. The **Training Centre** attached to **the Interstate Commission for Water Coordination in Central Asia (TC ICWC)** take responsibility for any shortcomings of this paper. The text and presentation of opinions are the sole responsibility of the TC ICWC. Professor **Victor A. Dukhovny, Director** SIC ICWC, functioned as chief editor of this document, in consultation with others at SIC ICWC.

The contribution of all who participated in this process is gratefully acknowledged. The authors would like to pay special gratitude is to CIDA and the Swiss Development and Cooperation Agency (SDC) for their financial support and much valued guidance. Data collection and processing for this paper were completed in view of preparations for the Fourth World Water Forum to be held in Mexico in March 2006. The preliminary arrangements for this important event were carried out under the "**Spirit of Kyoto – on the way to Mexico**" slogan. The TC ICWC hopes that the present paper would be regarded as ICWC's share to fulfillment of the precursory activities for the 4th WWF.

Pulatkhon Dj. Umarov,

Director,
TC ICWC in Central Asia

“...We pledge to preserve the natural water cycle throughout every basin; develop social norms with a noble regard for the survival of humanity and all other organisms; and engage in a concerted effort with all multi-stakeholders involved in basin conservation to take action towards this end...We walk hand-in-hand with the people of the world to whom we are linked through water.”

**Kyoto Water Declaration,
the 3rd World Water Forum
March, 2003**

1. INTRODUCTION

This paper presents a summary of activities that have been carried out by a team of regional experts specializing in the field of irrigated agriculture, in collaboration with the CIDA Training Project. The concepts, approaches, observations and findings reflected in this review are a result of collaborations with hundreds of water users and professionals at all levels - from the grassroots, through management and up to policy making levels. The training centre provided a unique opportunity to gather the views of a variety of stakeholders such as; ecologists, NGOs, Gender Equality (GE) specialists regional/national/local community groups, international and national organizations, universities and research institutes.

The project proposal entitled “*Water Resources Management Training Project in Central Asia*” was accepted for funding by CIDA in 2000. This was a ground-breaking project Central Asia - in both nature and scope. McGill University – the Brace Centre for Water Resources Management was selected as the Canadian executing agency (CEA) with Mount Royal College as Canadian partner.

The local partners and stakeholders identified in the PPF (Project Planning or Performance Framework) were as follows: *Main Partners* – Ministers of five Central Asian states comprising the Interstate Commission for Water Coordination (ICWC); *Stakeholders* – Governments of Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan and Uzbekistan (5 member-states of the ICWC), UMA Engineering, Global Environmental Facility (GEF), International Land Reclamation Institute, World Bank, FAO, USAID, UNDP, CIDA.

In August 2000 - *the CIDA-ICWC Training Centre (TC)* - was established in Tashkent (Uzbekistan). CIDA’s future-focused vision and commitment, strong support and highly professional guidance combined with efforts un-

dertaken by the five ICWC member-states permitted the TC to become a reality. The TC has turned out to be indispensable for capacity building in water sector through provision of training, information and knowledge exchange, introduction of innovative concepts and methodologies in new environments of transition to a market economy.

The CIDA-ICWC TC has developed into a centre of excellence for knowledge and skills dissemination; it has also started playing a leading role as a regional think tank and forum for round table discussions of vital issues including International Water Law. The TC has enhanced regional cooperation, build-up team spirit, facilitated conflict resolution process by maintaining consensus between water-related economic sectors throughout Central Asia. The TC was able to utilize the resources of SIC ICWC; more specifically – the sound scientific-research base together with “reform minded” water-energy-ecology experts. SIC ICWC provided key elements for the exchange of information and building of trust between all stakeholders.

The CIDA project successfully achieved the goals and objectives envisioned - this being confirmed by independent evaluation missions and regular analysis conducted during various stages of project implementation. Project monitoring and evaluation included annual Project Performance Reports (PPR) submitted to CIDA; this provided ongoing analysis of all project activities based on a Results Based Management framework..

Despite the complexity of the current socio-economic situation in Central Asia, water resources use and management at both on-farm and irrigation system/basin levels are undergoing rapid positive changes, quickly adapting to current developments, and meeting challenges of the modern times. The CIDA-ICWC Training Centre has certainly contributed to gaining momentum for such expedient transformations.

* * *

The CIDA's *Water Resources management Training Project* was completed on December 31, 2005. To advance to the next stage, a review of past achievements and lessons learned provides valuable information for future donors.

One of the lessons learned in the course of implementing the CIDA Project consists in conceiving crucial importance of appropriate and well coordinated international donors' financial assistance to newly independent developing states during their transition to a market economy.

It was exactly such type of support generously provided first and foremost by CIDA (and later by SDC, USAID and others) that made it possible to enhance the project scope, reach and objectives. Within five years, exten-

sive fundraising efforts on the part of SIC ICWC have resulted in launching of two additional TC branches under kind financial aid provided by CIDA and SDC. The newly established TC branches have started playing a significant role in implementation of IWRM in the region. The TC network made great gains through efforts to coordinate works with other organizations-projects that promote IWRM - such as IWMI, GWP CACENA, ICID, CAP-NET, UNDP and other.

To date, over **124 workshops** have been held and almost **2,000 participants** have received training within this unique regional Training Network. A number of proposals to establish new TC branches in Almaty (Kazakhstan) and Dushanbe (Tajikistan) are being negotiated with CIDA, ADB, USAID, and UNDP. Expansion of regional training potential, on the basis of a strong web-based network, will further strengthen the role of regional cooperation in achieving sustainable development of the Aral Sea basin.

A prerequisite critical for future development of the TC network is donor commitment for continual and ample financial support. The local stakeholders ability to gain self-sufficiency is severely constrained due to the poor economic situation in the region. The TC network would streamline training of the water professionals and assist with regional water resources planning, management and implementation of sound decisions on water allocations. This, no doubt, would help provide long-term stability and prosperity in the region, and a smooth transition to a market economy

This paper is organized into seven sections. A brief description of each section is provided below.

Section 1 - Provides introductory comments and outlines purpose of this paper

Section 2 - Describes the socio-economic context goals, objectives and main project achievements

Section 3 - Details the training activities and organization of TC network

Section 4 - Provides a summary of the Project management structure reporting, and monitoring and evaluation

Section 5 - Presents project results at output and outcome levels, and measures to expand initial project scope

Section 6 - Provides a summary of the project evaluation process, lessons learned, and pertinent findings

Section 7 - Proposes a vision for the Training Network - that incorporates international and regional donor contribution, and the commitment of the world water community - to assist with the challenges faced by the water sectors in Central Asia.

2. PROJECT MILESTONES

2.1. Background and Socio-Economic Context

The five Central Asian Republics (CAR) gained independence in 1991 after disintegration of the former Soviet Union. From the moment of their coming into being, the newly independent states have been dealing with a legacy of unsustainable Soviet economic development policies as well as unprecedented environmental devastation in the Aral Sea basin.

The Aral Sea basin (Fig. 1.) geographically coincides with boundaries of the biggest part of Central Asia and is located in the heart of the Euro-Asian continent. The basin extends over the territory of 7 countries, namely the five Central Asian countries: Kazakhstan (two south-western provinces), Kyrgyzstan (three southern provinces), Tajikistan, Turkmenistan, and Uzbekistan, as well as small portions of Afghanistan and Iran. Iran's part of the basin is small; however, Afghanistan's portion is substantial and its contribution to the average annual flow of the Amudarya is about 15%. (Iran and Afghanistan were not included in the CIDA Training Project). Except for Kazakhstan, about 90% of the territories of the four other Central Asian states are within the basins of the two main rivers, the Amudarya and the Syrdarya constituting the Aral Sea basin. This territory is located between longitudes 56° and 78° east, and latitudes 33° and 52° north, covering the area about 1.5 million km^2 (not including Afghan territory).

The largest part of Central Asia is located in an arid zone. Very low precipitation ($< 350\text{-}400$ mm/year), exceptional air dryness, high levels of evaporation, abundance of solar radiation are the main climatic features of this zone, covering the area of more than 300 million hectares. Civilization always concentrated near the water sources: rivers, lakes, and springs, and the people of this region idolize water. Water is identified with life and life is identified with water.

Freshwater in the Aral Sea basin has always been a shared resource. Between 1960 and 1990 over 1.6 million hectares of irrigated land were developed. The water infrastructure network includes: 80 water reservoirs – with an aggregate capacity of over 60 cubic km; 45 hydropower plants; 48,000 km of main irrigation canals and 268,000 km of on-farm irrigation canals. Water extracted from aquifers amounts to 10 km^3 per year. Over 330 aquifers have been prospected and approved to date.

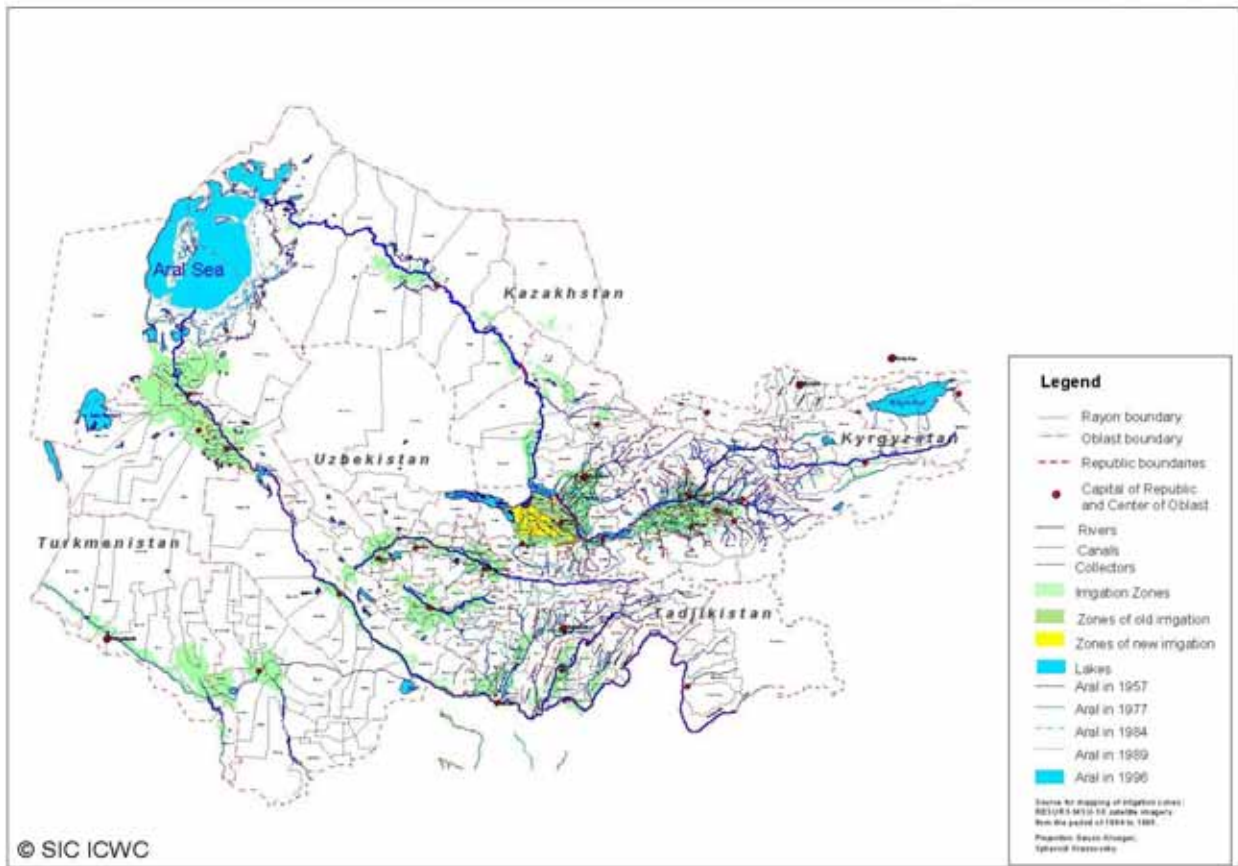


Figure 1. The Aral Sea basin

The large-scale development of irrigation during Soviet rule has changed the hydrological cycle of the region – the dramatic consequences of which include:

- Shrinking of the Aral Sea and disruption of the ecosystems. Over 33,000 square kilometers of seabed have been exposed- this has created vast salt plains inundated with agricultural chemicals.
- Soil degradation due to water-logging and salinization.
- Adverse health effects from poor quality of water and air.

The agriculture sector employs about 37% of the region’s labor force in Central Asia and contributes up to 25% of each country’s GNP. Since 1991, in the areas under irrigation, the crop yields have declined. Approximately 30% of the irrigated lands have high salinity levels - this reduced crop yields as much as 50%. This is very significant as 60 percent of the rural population in the basin directly or indirectly rely on irrigated agriculture to generate income. The level of income for most therefore depends on sustainable and guaranteed water delivery. The situation is further complicated by ongoing demographic pressure, necessity of improving social conditions and protecting the ecosystems. According to the

UNESCO *“Water Vision for 2025”*, the population in the Aral Sea basin may increase from 41.5 million (year 2000 figure) to over 57.0 million by 2025. Under this scenario, the question of sufficient water supplies to maintain food security becomes more acute.

Following independence in 1991, the regions water resources were no longer managed by a central authority, and former common water courses became international i.e. transboundary. The situation deteriorated as attempts to shift priorities in water use led to differences between upstream and downstream countries on the management of the transboundary levels. An urgent need emerged for: integrated water resource management at the regional and on-farm levels; more informed and coordinated decision making; and, for the introduction of innovative approaches for water use and conservation. The Governments of five Central Asian states are aware of necessity to take the appropriate actions in order to implement sound decisions on water allocation. This should have a significant impact on the long-term stability and prosperity of the region and a smooth transition to a market-based economy.

Among the first steps along these lines was the signing of Interstate Agreement (1992) on establishing of the Interstate Commission for Water Coordination (ICWC) mandated with joint water resources management in the Aral Sea basin and one of its executive bodies – the Scientific Information Center (SIC). Growing demand for water called a need to achieve and secure a balance of interests between regional and national interests in Central Asia. One of the best ways to do this was elaboration of a set of measures aimed to strengthen the capacities of regional water management and environment institutions to fulfill their mandates for cooperative management of water resources in the region, and involvement of all stakeholders in Integrated Water Resources Management (IWRM).

The authorities in Central Asia recognize that the most important component for improved water resources and ecosystem management is a highly qualified staff. Highly skilled local water professionals are especially required at the Regional, National and Provincial levels.

In this context, developing human and institutional capacity became imperative for increased participation and improved communication between organizations and agencies at all levels. ICWC was established to deal with water management issues throughout Central Asia, however a region as large as Central Asia in general, and the vast area occupied by the Aral Sea basin in particular, made difficult to bring people together who abruptly found themselves separated by administrative borders of newly independent states.

Reform-oriented water experts in the region realized the necessity to introduce new concepts (changes in mentality) and approach to transboundary water management given the new geo-political and socio-

economic conditions. The need to provide training programs and increase awareness of water management issues throughout Central Asia became clearer in mid-1990s. But at that time, the countries in the Aral Sea basin lacked the specialized training resources to deal with water related problems. The vocational training institutes set up during the Soviet Union had long been abandoned. There had been two agricultural/water management institutes of “advanced professional development” in the region, but they were abolished after disintegration of the Soviet Union.

In this connection, the idea to rehabilitate former training system (attaching to it new essence and dimensions) started emerging. Training to build capacity in water management professionals and water users at all levels had been acknowledged as an important instrument aimed at assisting with the development of practices inspired by the GWP promoted principles of IWRM. This tool was to be applied across the full range of water organizations. Later, when the idea came into being, rural self-governing grassroots community water bodies were also included in the sphere of IWRM training.

The subsequent discussions had led by late 1990s to forming the general opinion that necessary changes in approach could be achieved through some regional network able to design special courses, renovate university courses and implement on-job training programs. Initially, specific ideas discussed within ICWC included:

- Providing specific training courses on participatory approaches to transboundary water resources use and allocation;
- Encouraging multi-disciplinary training involving all kinds of water practitioners, including environmentalists, economists, engineers, social scientists, lawyers and businessmen;
- Developing modules for on-job training to keep practitioners’ skills up-to-date;
- Developing modules to train-the-trainers in new approaches and techniques;
- Creation of short courses on water management for policy makers, aimed specifically at senior managers without technical water backgrounds;
- Once formal training is completed, the concepts can be reinforced through a range of training activities (e.g. on-job training, short courses, remote learning, twinning arrangements, international short courses, etc.);
- Including water management in degree programs, in engineering and other faculties, such as economics, environmental sciences, biology, etc, or adding water as the main subject in such degree courses as the MBA.

During the preliminary discussions on ways to modernize training in the Aral Sea basin it was underlined that *the training of trainers* was a specialist area, requiring an understanding of learning methods and the significance of the peer group (farming community, professional water community) in creating learning opportunities. Equally, training of trainers in information exchange and communication required significant input into education programs by water resources management agencies. Proposed methods included in-service courses, seminars and workshops. There was an increasing emphasis on electronic means for dissemination of information, and distance learning training techniques. It was clear that the before mentioned approach would require a solid financial base and broad support from the international community.

Information exchange facilitators (such as extension officers, field guides and field agents) were expected to come from agriculture, soil and biophysical science and engineering sectors. Cross-disciplinary training in communication, group interaction facilitation, accounting and program management and counseling would also be required. Knowledge exchange systems would also need to be designed and introduced in order to provide capacity building support.

To make this possible, a special training centre (TC) was required that could: develop and deliver training courses tailored to the specific needs of the region; and take into consideration the changing conditions of transition to a market economy. Concurrently, there was a need to create a neutral forum, where representatives from the water policy and management levels could meet to discuss information sharing and policy. It was recognized that a prerequisite would be to have the TC established in close association with an existing centre with high-level scientific potential. The Scientific-Information Center (SIC) of ICWC was selected to serve in this role. This was a logical choice; SIC ICWC is highly recognized in the international community, and has years of experience bringing together leaders in their profession from the 5 Central Asian countries.

Since the mid-1990s, SIC ICWC has been the driving force for the creation of a regional training centre. CIDA was the first donor agency that shared this initiative. The CIDA Project originated through discussions between McGill University, the ICWC and the five Ministers of Water from the Aral Sea Basin at World Bank annual water seminars held in 1994-1999. In January 1999, senior officials from ICWC and McGill met with CIDA to discuss the project concept. The Ministers approved the selection of McGill University of Montreal and Mount Royal College of Calgary to further develop this responsive project in January 2000.



Approval of project	March 2000
First organizing and program meeting with ICWC members	May 2000
Study tour for senior water managers to Canada – USA	November 2000
Procurement of equipment	December 2000
Study tour for senior policy-makers to Canada	July 2002
Creation of TC branch in Osh with support of SDC	March 2002
Creation of TC branch in Urgench	February 2003
Creation of collaborative TC branch in Bishkek by Ministry of Agriculture and Water Management of Kyrgyzstan	February 2004
Prolongation of TC ICWC project till December 31, 2005	January 2005

Figure 2. Project milestones

In March 2000, McGill University's Brace Centre for Water Resources Management (Brace Centre), in partnership with Mount Royal College and in cooperation with the SIC ICWC, submitted a detailed proposal to CIDA. The five Ministers approved the Project Approval Document (PAD) in March 2000. This project provided financial support in order to set up a regional training facility in Tashkent (Uzbekistan) and conduct training over a 5 year period. Initial training sessions were held in Central Asia (with participation of Israeli partners) and in Canada. Later, other donors (USAID, SDC) joined the efforts in rendering funding assistance.

2.2. The Project, Goal and Objectives

The Water Resources Management Project in Central Asia was designed as a five-year regional project.

The initial goal and objectives of the TC ICWC Network:

Goal: To promote good governance, environmental sustainability and democratic reform by building local capacity for water resources management in the Aral Sea basin.

Objectives: To establish a self-sustaining Water Resources Training Centre; to build local capacity in the areas of water resource management and peace building in the region; and to help reform policies and institutions to improve water management and sharing issues.

According to the project's provisions, CIDA was to render support for the development of study tours, seminars, courses and a train-the-trainer program with the ultimate aim of creating a local, sustainable Centre of Excellence in water management training. The project directed its programming at various levels, including the policy, management, technical and grassroots level. Capacity building was an intrinsic component of this project.

The project included seven main activities that were carried out over the course of five years:

Activity 1 – Inception mission to review ICWC training programs, staff and facilities

Activity 2 – Study tour to Canada for senior policy makers

Activity 3a – Study tour to Canada for senior water managers

Activity 3b – In-country workshops and seminars for senior water managers

- Activity 4 – Short-term water reform courses
- Activity 5 – Short-term technical courses
- Activity 6 – Development of self-teaching courses and regional program
- Activity 6a – Regional dissemination missions
- Activity 7 – Training of ICWC staff and equipment procurement

The expected project results identified at the output, outcome and impact levels are shown below (cross-referenced to project activities described above).

Table 1: Expected Results of the Project

Outputs	Outcomes	Impacts
<p>1. Canadian partners gain clear understanding of the strengths and weaknesses of ICWC programs, staff and facilities.</p> <p>2. Senior Central Asian water policy makers gain increased knowledge of international water management institutions and treaties which enhance regional cooperation and a better understanding of how this project will contribute to this end.</p> <p>3a. Senior Central Asian water managers gain increased understanding of the dynamics of peaceful water resource sharing and its benefits.</p> <p>3b. Senior water managers from all five countries build better lines of communication through discussions relating to international water management and peaceful resource sharing.</p> <p>4. Middle water managers in government and basin authorities gain increased skill and knowledge in institutional reform, decentrali-</p>	<p>1. <i>(Linked to activities 1, 3a, 3b, 4 and 5)</i> Increased capacity of government and basin authority staff at operations, technical and managerial levels to apply reform skills and replicate training to others.</p> <p>2. <i>(Linked to activities 2, 3a and 3b)</i> Senior government and basin authority managers and policy makers promoting the establishment of an integrated water management network in the five Central Asian states.</p> <p>3. <i>(Linked to activity 2)</i> Institutional reforms proposed / implemented that</p>	<p>1. <i>(Linked to outcomes 1 and 4)</i> Sustainable and expanding cadre of reform minded water management personnel working at all levels (operations, technical, management and policy) with the assistance of dispersed train-the-trainer operations, a state-of-the-art central facility and distance education.</p> <p>2. <i>(Linked to outcomes 2 and 3)</i>. Increased interstate cooperation and peace building with respect to water management achieved</p>

Outputs	Outcomes	Impacts
<p>zation and demand driven management.</p> <p>5. Technical personnel gain increased skill and knowledge in issues related to ecosystem and resource conservation, conflict resolution, water laws and integrated water management.</p> <p>6a. CD-ROM and internet courses oriented towards distance education developed and promoted to selected grassroots audiences (mainly local operations and water users) outside of Tashkent.</p> <p>6b. Grassroots water management personnel in Kazakhstan, Kyrgyzstan, Tajikistan and Turkmenistan gain increased awareness of regional water management issues through the material developed in activity 6 as well as the overall progress of the program in Uzbekistan.</p> <p>7. ICWC staff gains knowledge through McGill's example on how to manage and deliver programs in the long-term, using state-of-the-art equipment.</p>	<p>promote increased international dialogue and cooperation with respect to water resources.</p> <p>4. <i>(Linked to activities 6 and 7)</i> Capacity of ICWC to continue and expand the results of this project beyond the lifetime of this project enhanced through better-trained staff, improved equipment and teaching materials.</p>	<p>through institutional reforms, interstate water management and communication networks.</p> <p>3. <i>(Linked to outcomes 1 and 2)</i> Improved environmental stewardship achieved through more efficient water use, better water quality and less pollution.</p>

2.3. Inputs. Risks and Risk Mitigation

2.3.1. Inputs

Initially, CIDA was to provide \$1,775,053; other contributions totalling \$443,075 were to be provided by McGill (\$220,386), Mount Royal College (\$91,260) and ICWC (\$131,430) for a total project budget of \$2.22M.

In the Contribution Agreement signed on March 31, 2000, the total value of CIDA's contribution was increased slightly to \$1,795,129. Other contributions also increased slightly to a total of \$456,037, to be provided as follows: McGill (\$233,347), Mount Royal College (\$91,260) and ICWC (\$131,430) for a total project budget of \$2.25 million.

On July 19, 2000, CIDA's contribution was amended to \$1,791,348. The total of other contributions was also decreased slightly to \$439,468 to be provided as follows: McGill (\$225,128), Mount Royal College (\$89,960) and ICWC (\$124,380) for a total project amount budget of \$2.23M.

2.3.2. Risks and Risk Mitigation Strategies

The key risks and correspondent risk mitigation strategies identified for the project in the PPF included the following:

Extraneous political and economic factors could make regional cooperation difficult. However, broad-based international cooperation would be encouraged at the technical, operations and management levels in addition to political/policy levels. In fact, delays in some activities involving Canadian Trainers occurred due to a travel advisory restriction posted by Canada External Affairs in September 2001 (international political/military developments in Afghanistan in connection with terrorist acts in New York on September 11, 2003). The Project schedule of activities was adjusted and restored during the course of the 2002 – 2003.

It was believed initially that qualified trainees might be difficult to find. However, the project enjoyed the support of the highest levels of government in Central Asia, who had indicated that there was a strong need for this type of training. In fact, hundreds of qualified male and female trainees have participated in the ICWC workshops. These trainees have come from all five-member countries and from middle to most senior government management levels.

Trained personnel might not wish to remain in Central Asia following their training. However, the project was to promote region-specific training and demonstrate the global importance of Central Asian environmental issues (on the example of the Aral Sea basin). To date, the Project trainees appear to have remained in the region. The Project has lost some personnel who relocated to positions with other donor projects. Higher salary was the motivating factor for the transfers. Fortunately this was a rare occurrence and the TC has been able to retain all key staff.

3. FRAMEWORK AND REACH OF THE TC ICWC

3.1. Framework of ICWC Training Network

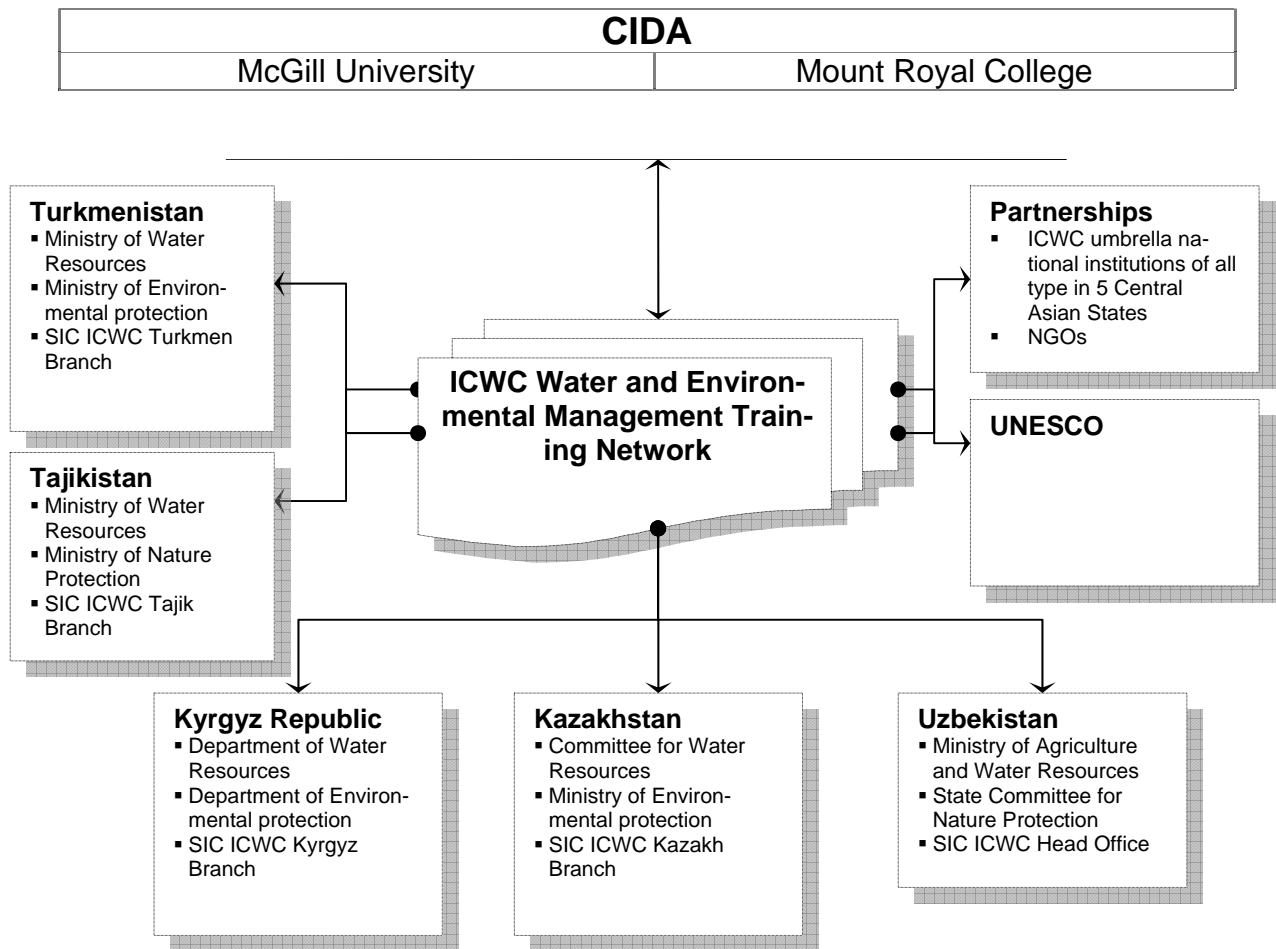
At present, the ICWC Training Network consists of the Central TC in Tashkent (CIDA-funded), the Urgench TC Branch (CIDA-funded), the Osh TC Branch (funded by SDC), the Bishkek TC Branch (Ministry-funded) and the Almaty TC Branch (USAID funded). There is plan to establish additional TC in Tajikistan (Dushanbe) and further develop the network's focal-points throughout the region.

The Central TC was established as the initial training centre in 2000 with its seat on the premises of the BWO "Syrdarya" in Tashkent, Uzbekistan. It started serving as the main ICWC Training Centre for participants from all five CARs, as a regional think tank and centre of excellence for training of trainers to be engaged in the ICWC network. To date, the Tashkent TC has conducted **62** workshops (since April 2000), at first focusing on the senior water policy makers and management levels and then spreading to grass roots, having provided training for a total of **1130** participants from all five countries.

Framework of activity reach is illustrated in the graph below (Fig. 3)



Figure 3. ICWC TC framework



To further extend regional dissemination of training and enhance adaptation of workshops and training materials to local contexts, it is expected that the proposed ICWC Branch TC in Tajikistan will use training materials prepared by the Central TC in Tashkent; this subject to modifications proceeding from specific local conditions and consultation with trainers both from Tashkent TC and local moderators and lecturers.

In Tajikistan, the World Bank has agreed, in principle, to contribute USD \$100,000 for repair of the building in which the planned Training Centre is to be housed as stipulated by its Rehabilitation of Rural Infrastructure Project. A preliminary request to support the purchase of equipment for the TC branch has been submitted by the ICWC to UNESCO. Further funding is needed to support capacity building of local personnel (management and trainers) and to support workshop-related expenses such as travel and accommodation for local participants.

3.2. Activity description

ICWC role in development of Training Centre

ICWC had pledged to make its own contributions to the development of the Training Network. Kazakhstan, Kyrgyzstan and Tajikistan water management authorities as well as two BWOs - "Amudarya" and "Syrdarya" undertook significant works to enhance the network. The establishment of TC branches in Osh and Urgench serves as good examples of the above stated. Tajik water management authorities expressed willingness to allocate space and other assets for organizing TC branches Dushanbe. ICWC members have also participated in planning of the TC activities – since Central Asian countries are major beneficiaries of the Project, training programs and TC Work Plans are submitted for consideration and approval at each meeting of the ICWC. ICWC members give their comments as to schedules and contents for training.

ICWC executive body Scientific Information Centre and its five national offices have made substantial contribution to the Training Centre activities on an on-going basis. SIC ICWC plays the role of supervisor for organizing the seminars and training sessions, assigning moderators and lecturers, providing transportation and other support necessary for the TC activities.

The personnel of the SIC ICWC have, for a long time, engaged in diversified research work of scientific and applied nature. In addition, it employs professionals from all Central Asian countries that are highly experienced in the field of land/water use and in-depth studies of advanced methods of irrigated agriculture in the Aral Sea basin. Thus, SIC ICWC has accumulated extensive and valuable data/knowledge base while successfully implementing a wide array of specific water-related projects of local, transboundary and regional significance. This solid scientific and practical foundation enables executives of the Project and recruited trainers to design and develop relevant training materials of highest standards – this having been confirmed time and again by reliable international expertise.

Furthermore, SIC ICWC has maintained a wide circle of pertinent partnership contacts and continues searching for new resources to expand the range of cooperation with international water community. These possibilities are used to attract participation of additional donors' funds and international organizations in the TC activities. SIC ICWC offices in Kazakhstan, Kyrgyzstan, Tajikistan and Turkmenistan have also been used to approach national water and environment authorities, NGOs and public at large for introducing and strengthening participatory approach to forming a platform for fruitful synergy of training, science, practice, business, institutional development and social mobilization.

TC Branches:

The Urgench TC Branch was established as a branch ICWC training centre under the CIDA Project in 2003 in order to better serve participants from Turkmenistan and northern Uzbekistan (i.e. Khorezm Oblast and Karakalpakstan Autonomous Republic). It is located on the premises of the BWO "Amudarya" in Urgench. The Urgench TC has conducted 19 workshops since July 2003, providing training for 313 water users and managers. Training at the Urgench TC focused on introducing the principles of IWRM to the region, particularly Turkmenistan, and on ecological issues related to the Aral Sea. To date, training has been targeted to the technical and operational levels; Training followed 3 key themes:

- 1) Contemporary Problems of Water Management;
- 2) Perspectives and Opportunities of Implementing IWRM in the Downstream (the Amudarya River countries); and
- 3) Water Accounting (and Measurement) on Hydro-structures.

The Osh TC Branch was established in 2002 to specifically meet the training needs of the Swiss-funded \$1.7 million Integrated Water Resources Management (IWRM) Project that focuses on the Ferghana Valley. The Osh TC Branch is funded by the SDC project, with training seminars provided both within the context of project activities in relation to other donor projects being implemented in the Ferghana Valley. The Osh TC Branch has conducted 43 workshops since May 2002. It has trained a total of 455 participants from the Ferghana Valley region, including participants from the Kyrgyzstan, Uzbekistan and Tajikistan. The Osh TC Branch has been brought to the forefront of developing training workshops and materials focusing on the interrelationships between water resources management, agriculture and environment, involving both theory and practical on-farm demonstration training. It targets Water User Associations (WUAs) and the grassroots (i.e. farmers) level. Key themes included: 1) Water Users Associations; 2) Water Use and Accounting at the Farm Level; 3) Water Use and Conflict Resolution in the Ferghana Valley. Additional training was provided on topics such as: Water Use and Accounting at the Farm Level; Extension Services for Water users and Farmers; Advanced Water Distribution on Pilot Canals and Development of Pilot Canal Water Boards (CWBs); and Ecological Monitoring.

Trainees participating in the Osh workshops are primarily stakeholders and beneficiaries of the IWRM-Ferghana Valley project representing various levels, including senior policy makers, senior water managers and technical/operational personnel. As a result of the IWRM project, the Osh TC has also been at the forefront of developing grassroots-level training within the ICWC training network. IWRM and WUA training materials and experience from the Osh TC/SDC Ferghana Valley Project have been widely used by ICWC trainers at the Urgench Branch TC.

Interviews with various stakeholders in the region has confirmed that the Osh Training Centre, although funded by SDC, could not have been established without the initiative, guidance and capacity building support (i.e. trainers trained in Tashkent) of the Central TC. Similar to the Urgench Branch TC, the Osh TC submits annual Work Plans and budgets to the Central TC for approval based on the priorities and directions of the SDC IWRM Ferghana Valley Project. SIC ICWC serves as a co-implementing agency for the SDC project in partnership with the International Water Management Institute (IWMI).

Description of main training courses

There are the following major training courses provided at the Tashkent TC:

- 1) Integrated Water Resource Management (IWRM);
- 2) Advanced Irrigated Agriculture;
- 3) International and National Water Law;
- 4) Transboundary Waters: Strategies to improve regional cooperation.

1) IWRM

This course provides an overview of IWRM principles (i.e., Dublin Principles) and outlines the basic requirements for IWRM implementation and the latest debates, views, concepts and levers, and instruments in Integrated Water Resources Management. The objective of the specialization is to train water resources managers responsible for the planning, development and implementation of water resources programs and strategies. By the end of the course, the training participants are expected to be able of:

- identifying an appropriate enabling environment, institutional roles and integrated management instruments;
- analysing the present and future demands;
- working out integrated plans for river basins and watersheds.

In the development and preparation of this course material the ICWC Training Centre and SIC ICWC have cooperated with the UNESCO-IHE University in Delft, the Netherlands, United Nations Economic and Social Commission for Asia and the Pacific and Global Water Partnership for Central Asia and Caucasus (GWP CACENA).

Most of organizations located in the upstream zones of the Syrdarya River basin have substantial experience and knowledge on implementation of IWRM. This conclusion could be seen on the example of IWRM-Ferghana

Valley project. Further development of water resources management requires implementation of IWRM in the whole region. From this point of view a special training program started addressing water users and managers from farms and organizations located in the downstream areas. The training program consists of special modules developed by the Tashkent TC trainers.



2) Advanced Irrigated Agriculture

Irrigated agriculture is the main sphere of economic activity in all of the Central Asian countries. It employs the overwhelming majority of the working population and generates a significant economic output. Future economic growth in Central Asia as a whole largely depends on how effectively the countries, individually and together, will be able to implement reforms aimed to increase both land and water productivity. This course highlights contemporary challenges for irrigation and drainage in all five countries. In addition, it offers an overview to the improving irrigation management and modernizing irrigation and drainage systems as institutional, environmental and economic issues affecting irrigated agriculture. HR Wallingford, UK, and UNFAO IPTRID have provided technical assistance and support for the development and preparation of this training course material.

3) International and National Water Law

The ICWC Training Centre, in cooperation with the International Water Law Research Institute (IWLRI) of the Dundee University (UK) has developed and delivered a series of training workshops on this subject. The materials have been adapted to reflect the specific nature of legal and institutional issues relevant to Central Asian transboundary water resources management and development. Emphasis was placed on treaty-based regional practice with full reference to applicability and relevance of fundamental principles of international water law (e.g., equitable and reasonable utilization, participatory approach and no-harm principles) with due consideration given to the current challenges of water use and management in the region. Due to demand, a course was also developed that broadened its content to include national water laws and policies of Central Asian countries.

4) Transboundary Waters: Strategies to Improve Regional Cooperation

One of the specific aspects of the transboundary water resources management in Central Asia is characterized by potential of conflicting and competing uses for water between irrigation, hydropower and the environment (the Aral Sea and its river deltas). This course incorporates lectures delivered by professional experts who represent irrigation (downstream) and energy (upstream) sectors and environmental agencies. They provide an overview of contemporary issues and outline a set of actions required for balancing competing uses by various economic sectors and national conflicting interests. In the preparation of this program, the ICWC Training Centre has collaborated with several institutions including the IWLRI and a number of international projects of regional scope.

Training incorporated a variety of water-related topics, which were discussed and debated by trainees. These topics include:

- Aral Sea Basin Management Model;
- Dialogue on Water and Climate;
- Water and Ecology;
- Water and education;
- Water and Gender Equality Issues;
- Environmental Protection Issues;
- Roundtable on Water, Energy and Climate;
- Monitoring and Provision of Safety of Hydro-technical Structures.

In 2004, the Project enhanced the scope of its reach (due to movement of water sector towards a market economy) and addressed the practical needs of a rapidly increasing number of individual private farmers. A new task appeared – that of disseminating practical skills enabling management staff to interact with water users to assist them in formation of Water Users Associations (WUAs) and Water Users Federations (FWUAs), and to implement advanced methods of irrigated agriculture at the on-farm level. Hence, new topics were included in the curriculum:

- Contemporary Problems of Water Saving and Conservation;
- Soil & Water Resources Management at the On-Farm Level;
- Water accounting and measurement on communal structures;
- Developing of water use plan for WUAs;
- Field passport systems.

(See Annex 1 - The list of training topics)

The important TC activity vector is information distribution among leading water sector specialists as to the advanced world experience in the field of water resources management (success stories and case studies from Australia, Canada, Spain, USA, China, Pakistan, India and other countries).

3.3. Selection of participants

3.3.1. Requirements for selection process

To ensure inclusive and participatory approach to training, its high efficiency and appropriate feedback, ICWC members (mainly water management ministers of Central Asian states) identify participants as representatives their respective countries, and according to the pool available funds. Needs assessment is conducted giving consideration to on-going projects in Central Asia and workshops being held. When necessary, participation of other water experts rather than indicated by ministries, are to be agreed with ICWC respective division. Furthermore, ICWC TC puts no limit to self-financing students and there are no fees for engaged scholars. Selection of participants from other economic sectors and fields of activities at the level of state ministries and agencies is a prerogative of Heads of these entities.

There are the following prerequisites advised by the TC ICWC for the selection process:

- “Hands on” position within the organization or rural community;
- Experience of work in dealing with water related issues;

- Ability to promote the implementation of the recommendations and strategies developed during the training course;
- Ability to disseminate information among other colleagues.

Selection of participants in Urgench TC follows the same principles, but with a focus on middle and lower rank water managers. The Osh TC participants are mainly, grassroots water users and farmers.

In case of special events, selection process is based on needs and requirements of the event. For example, participation of water specialists from Ferghana Valley (Kyrgyzstan, Tajikistan, Uzbekistan) predominate in Osh TC because this unit is financed by SDC within "IWRM-Ferghana" project.

Unfortunately, it had not been anticipated at the inception phase of the Project that selection of trainees would dependent upon approvals from the Central Asian Government Ministries. This affected the "level" of water resource professionals trained- ideally, trainees should have also included Central Asian water policy makers from the Cabinet of Ministers. This could have enhanced the cause-effect relationship at the output and outcome results level. Full participation of senior policy makers/water managers from Turkmenistan was also hindered due to administrative hurdles encountered.

3.3.2. Gender-responsive approach

The Training Centre paid attention to issues of the Gender Equality (GE) aspects taking into account the historical gender situation and limited pool of local experts or professionals with whom to include as participants. Achievements made in the last two years of the Project surpassed those anticipated in the original project design. The SIC ICWC took the initiative to include female specialists for key positions, such as: Gender and Legal Adviser for Tashkent TC; Head of the Urgench TC; and as regional Manager of the CIDA-funded the *Water Scarcity and Drought due to Climate Change* project. Their involvement raised awareness of GE issues in the water sector in the Aral Sea basin. In addition, the Brace Centre hired a Canadian GE specialist to provide input for GE interventions on the two CIDA projects. Furthermore, three female staff members of the Canadian Executing Agency spent time in the field working with the project partners and stakeholders. In the opinion of the Brace Centre, the impact of their work in the region is enormous.

A project success story was the establishment of an internet web page dedicated to "Gender and Water in Central Asia" (**www.gender.cawater-info.net**). This work was initiated by SIC ICWC.



3.3.3. Generating concerned and task-oriented participation of trainees

To ensure a task-oriented participation of trainees an interactive workshop training format was used. Workshops were designed for specific target groups of water users or managers. Core training materials were prepared by local experts and distributed to participants well in advance of each training session. Workshop methods included round-table discussion periods, group debates, and exchange between trainees at breakout sessions. This process was guided by experienced workshop moderators. This was a new approach for most, and proved very beneficial as a means to enhance mutual understanding, common grounds, openness, and trust between participants. The format also provided some experience that will prove useful for future dialogue between the water sectors.

In essence, every workshop took the form of a “round-table talk”. The participants acted as “negotiators” representing various countries and sectors of the economy. The training materials provided the themes for brainstorming, the moderators guided the process in order to achieve a consensus at inter-sectoral and interstate levels. Participation in problem solving using simulations of situations in water resources management was a particularly useful tool.

Detailed workshop reports were prepared that included minutes of the collective decisions on issues discussed. Participants worked out differences and voted on decisions. The minutes of each workshop were then distrib-

uted between ICWC members and stakeholders of the Training Project for further dissemination in 5 countries.

Training participants underlined in the workshop Minutes the need to inform national water management authorities on issues discussed so that they could be given proper weigh in planning and improvement of water management at all levels. Having followed requests by trainees, TC published "Selected Minutes" containing proposals and recommendation put forward during workshops. (For details, refer to <http://sic.icwc-aral.uz/tc.htm>).

In addition to the workshop training, the TC staff organized study tours for the participants to visit hydraulic structures and water management facilities. This provided on-site training and further exchange of opinions on key subject matters.

Workshop participants showed keen interest in a series of lectures on *Traditional and Moslem Rights for Water* as well as indigenous methods and principles of irrigation based on community approved equitable and reasonable water use. Active discussion between representatives from upstream and down-stream areas was evoked by references to the *Sharia*¹ provisions and historical evidences of traditional attitude of Central Asian population to water as 'a gift of God, giving life' that cannot be anybody's property or serve as a subject for sale and purchase. TC lecturers purposefully drew historical parallels between provisions of International Water Law and the millennium-long traditions of local water use – thus, they managed to facilitate deeper insight of trainees into significance of regional cooperation, conflict mitigation and application of IWRM principles for shared use of the regions water resources.

Very convincing for trainees in this respect was, for instance, the authoritative information by a well known irrigator-researcher of ancient Asia S.N. Rauner, who wrote²: 'Ancient custom of water use has worked out a Code of Laws, existing for thousand years. This non-written Law had many provisions: - determination of units for water measuring; - setting or rejecting the land owners duties to pass water through their fields to the fields of other people; - determination of the right to participate in private and common profit and usage of somebody else's water or lands; - setting or rejecting the necessity to determine the distance between canals; - determination of the water quantity and the turn to use it to a person, society, settlement, town, etc.; - setting the order of preventing negative consequences in cases of water excess; - setting the kind of sowing and quantity of the land subjected to be sowed depending on water volume; - setting the order and turn of water usage in the case of its lack; - pointing

¹ The code of law based on the Koran

² Rauner S.N. *'The artificial irrigation of lands'*, The Academy of Science publication (St. Petersburg, 1887)

out various ways of constructions and reaching solutions of misunderstandings in the process of water use; - setting common interest for water users from the same canal or river basin and working out the ways to define this participants' interest against interests of their neighbors or above located settlements'.

Workshops' organizers paid attention to provide a suitable environment where trainees could interact with colleagues engaged in tackling similar problems of water resources management in their respective countries and sectors. Discussions between participants during coffee breaks and lunch periods were also very productive. It takes on special significance considering that the present trainees – young specialists may tomorrow be promoted to senior positions in local and national water authorities, enterprises and even sectors of economy – thus being would-be decision makers.

The training course on “Integrated Water Resources Management” exemplifies effectiveness of generating concerned and task-oriented participation of trainees. More than 400 specialists of high and medium levels, as well as representatives of grass-root water users and WUAs, participated in training activities devoted to this subject. Training provided information on: IWRM principles; the significance of and necessity for reforms in the sector through implementing advanced methods of water resources management (based on hydrographic and integrated approach); equal consideration of all water users' interests and coordination at all water sector hierarchy levels; the need for consensus building and broad public participation in solving water crisis in the world (with references to specific situations and case studies). Subsequently, a large number of these trainees became actively engaged and, in fact, provided favorable conditions for promoting IWRM approaches while implementing “SDC–IWMI Program in the Ferghana Valley” on test sites located in Kyrgyz, Tajik and Uzbek parts of the Ferghana Valley.

The importance of training is further highlighted by the challenges faced by earlier projects in the Ferghana Valley. For example, earlier initiatives such as the “Peace Building” Project (CIDA) – did not have preliminary component that included training of a variety of stakeholders. As a result the project did not get the anticipated response among local water professionals. Whereas, later - owing to the enhancement of the circle of like-minded specialists through TC ICWC' round-table sessions, and the promotion of IWRM principles by TC ICWC' trainees, - the spirit of partnership between SDC–IWMI Program's participants (the water managers and users from different countries working in the Ferghana Valley) started to improve.

Assessment of the inception phase of the SDC–IWMI Program, conducted at the Training Center with participation of more than 80 specialists, water users, representatives of water management agencies, heads of province

and district water-related organizations, province/district deputy governors, NGOs - revealed astonishing unanimity in support of the IWRM methods. The application of hydrographic principle and public participation was identified as the only way of survival in this social tension-affected region in conditions of increasing water resources deficit and growing demographic pressure.

3.4. Recruitment of trainers

Trainers were initially recruited from SIC ICWC, affiliated scientific/research organizations (i.e. Scientific Production Association Central Asian Research Institute of Irrigation - SPA SANIIRI). Later a step-by-step approach was followed in order to include representatives from all key water resource management stakeholders from the five ICWC member states.

Trainers at Urgench TC are a combination of local trainers including management of the TC and BWO "Amudarya" and moderators and lecturers assigned from the Tashkent TC. Trainees participating in the Urgench workshops are primarily technical/operational level personnel, with participation of some senior water managers.

Trainers in Osh TC, considering that SIC ICWC in collaboration with IWMI is implementing a project on "IWRM in the Ferghana Valley", are represented mainly by team leaders of this project. In addition, trainers from other stakeholder organizations are engaged.

According to needs of a specific training program, the Training centres utilized outside specialists where needed. For example Canadian and other foreign specialists were used for training on workshop methods, Gender Equality issues, International Water Law, approaches to water distribution and delivery at the community and on-field levels, negotiation and mediation, and International Accounting.

The above mentioned practices of selecting and engaging trainers in TC activities has advanced the formulation and implementation of an interactive approach for education and exchange of opinions between moderators and participants from different countries and sectors. This in turn promoted the preparation of a common framework for understanding and mutual collaboration between grass roots and "decision makers" in water and environment sectors. The creation of a common bond between stakeholders - "the feeling of common water" - has proven to be the missing link required to consolidate the peace-building process in relations between Central Asian states.

4. APPROACHES TO PROJECT MANAGEMENT

4.1. Project management and reporting

It would be impossible to achieve the goal and objectives of the Project without a well-defined, well-placed and clear management structure. The effective management provided by the CIDA project CEA and SIC ICWC provided a framework whereby a clear strategy was developed, timely adjustments were made based on analysis of intermediate results, and strict control over financial matters was possible. Project reporting was rigorous; this made more difficult due to underdeveloped communication networks within Central Asia.

The McGill Office of International Research (OIR) played a critical role in contract and financial management. The *Water Resource Management Training Project in Central Asia* was governed through a Project Executive Management Committee (PEMC); members of this committee included the Director of the Brace Centre, the Director of the SIC ICWC, the Financial Officer at OIR, the Project Manager, and the Associate Director of the Brace Centre. At least one annual meeting of the PEMC was held; the Director of the Training Center of ICWC participated in a number of these meetings. The McGill Accounting Department provided an enormous amount of support to the PEMC.

The PEMC focused primarily on overall project management issues. A Project Implementation Committee (PIC) was set up to deal with the day-to-day operational issues of the Project. Members of the PIC included the Director of the Brace Centre and the Director of the SIC ICWC. This PIC met very frequently in 2000-2005, either in Canada or Central Asia, either physically or via e-mail and conference calls. The Canadian Project manager traveled to Central Asia at least 3-4 times a year; each visit was for a minimum of 2 weeks. The Canadian project manager reviewed financial controls and TC workshop methods and results, participating in TC's activities, and provided support to TC staff. The TC prepared workshop and financial reports for Brace. Brace in turn reported to CIDA on a quarterly basis.

At the operational level, the daily activities of TC ICWC are managed under the supervision of SIC ICWC. The principle, and most challenging tasks for the TC staff and SIC ICWC consultants revolve around the delivery of the workshops - this being an on-going "creative" process. The TC staff provides logistical support (permits, arrangements for travel, accommodation and meals) for participants from outside Tashkent.

The TC activities are planned on a quarterly basis; the workshop schedules and topics must first be reviewed and approved by ICWC members (Ministers of 5 countries). The subject matter of each workshop is also examined and debated at SIC ICWC and reviewed by Brace Centre. Training materials are routinely updated to better reflect the current situation. Workshop participants are encouraged to provide comments and suggestions as part of the "roundtable discussion period. This proved most beneficial as a learning tool, especially for those with no prior experience making presentations. This encouraged positive dialogue and a cooperative spirit between participants.

Each training session is tailor made to suit the needs of the target audience. For example, workshops and field demonstrations for grass roots water users and farmers need to be carefully structured and delivered in manner very different then for participants from management levels. The terms used and arguments presented to farmers has very distinct requirements. Participants at the senior water manager level and NGOs typically require more detailed and technical analysis. This often needs to be supported by specific case studies, simulation exercises, and modeling forecasts.

A workshop meeting is held on the last day of each training event where participants debated the key results-conclusions for inclusion into the Workshop minutes. This proved to be a very important consensus building exercise. Following completion of each workshop, the TC Staff prepared a detailed workshop report, complete with the before mentioned minutes. Brace used these reports as one means to monitor progress, identify weak areas, and develop strategies to enhance training effectiveness. Questionnaires were also routinely used where participants could provide feed-back on training methods, topics, logistics, facilities, and TC support.

Also helpful for Project management was the database established for training centre "graduates". Initially, the database (<http://tc.aral-sea.net>) was established as a register of current information on trainees and their career development; later the TC utilized the database for accumulation and analysis of questionnaire results from Tashkent and TC Branches. The database updated on a regular basis to either add new participants or revise profile information. To date the database contains information on more than **2000** participants most of which continue to exchange information with the TC.

Internal monitoring and control is supplemented by weekly meetings convened by the Director of SIC ICWC. At this time a comprehensive review of each workshop is made, workshop minutes and reports reviewed along with an analysis of training materials. Strategies are then developed in order to improve the workshop delivery methods and logistic support provided. In order to track the efficiency of TC functions, in February 2003 a *TC staff-member's daily worksheet* was established to keep records on

project inputs. This information will be used to better estimate costs for the establishment of future branch TCs.

The organizational structures of the Training Network (TC branches in Tashkent, Urgench, and Osh) are provided below (Fig. 4, 5 and 6).

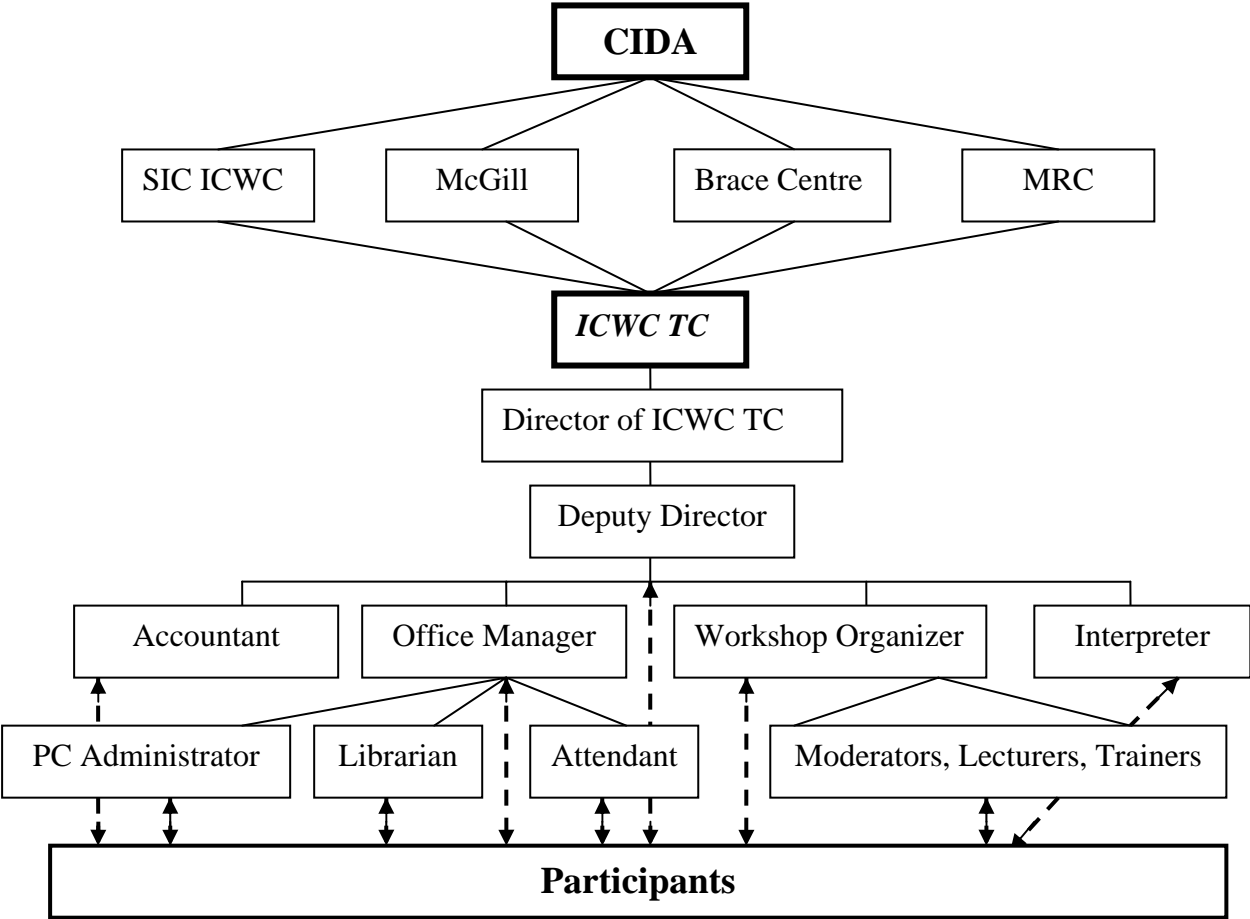


Fig. 4. Organizational structure (Tashkent TC)

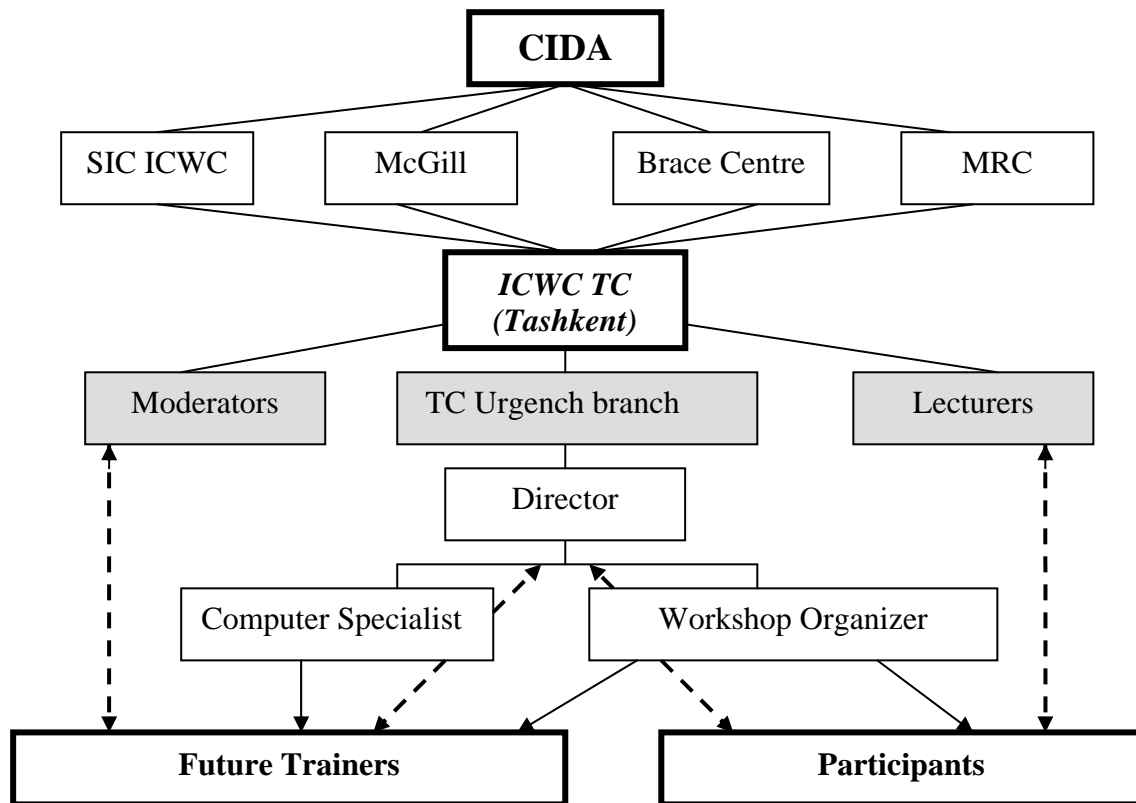


Fig. 5. Organizational structure (Urgench TC branch)

4.2. Monitoring and Evaluation

A clearly designed and systematically applied Monitoring and Evaluation system was an essential component of this project. The information provided below should prove very useful for others considering similar project works. The project monitoring and evaluation was established utilizing a "Results Based Management" (RBM) framework. The RBM framework detailed the expected project results at 3 levels; namely, the output, outcome and impact levels. Qualitative and quantitative indicators - measured at each of the results levels - provided feedback whether the project was producing the desired effects. The strength of the RBM system is it permits adjustments to be made to the project activities based on the information collected; the project was therefore driven by results, not activities. This tool was extremely helpful and permitted modifications to project activities to enhance the project results. The CIDA contract was designed with the RBM framework in mind, thereby permitting changes to activities based on the RBM system.

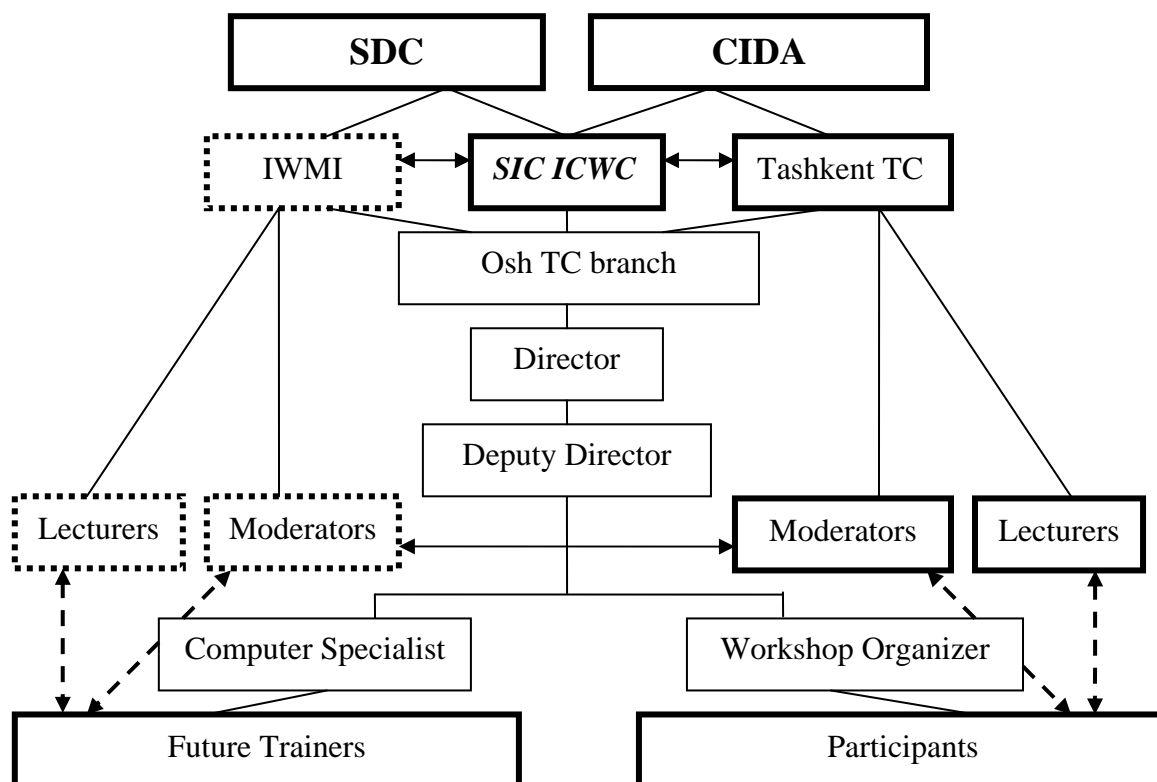


Fig. 6. Organizational Structure (Osh TC branch)

The Brace centre and TC staff jointly collected monitoring information; some methods included questionnaires, interviews, meetings, and project reports and database. Close cooperation between Brace centre and the TC staff was key for the successful implementation of the M+E. Questionnaires were modified and interview techniques revised to accommodate the local conditions and customs.

The monitoring of training results was achieved by:

- Application of questionnaires prepared by TC ICWC staff (See Annex 8.2.) filled by participants of training sessions after each of 75 workshops conducted in the course of the Project at different levels of seniority and technology;
- Employing of questionnaires prepared by the Brace Centre for participants at selected workshops who have just finished a workshop, or who attended previous training events and could report on the application of new skills and abilities in their work situations;
- Introduction of a modified Standard Course Evaluation Form developed by McGill University with a view of applying it to the activities of TC taking into account the approach to training as a framework for consensus;

- Conducting interviews with water resources use regional and national stakeholders and workshop's participants. All in all more than **200** relevant persons (including ministers and other senior water policy makers) have been interviewed by various representatives of the Project management and the independent Project Review Team during the period of five years;
- Multi-lateral participation of regional/national stakeholders in developing the Training Center's web-site (**www.tc.icwc-aral.uz**) and data base;

Within the framework of *M&E*, *additional* works carried out by TC Staff included:

- Proposal made to build-up the monitoring capacity of the network (including funding of required equipment).
- Reassessment and analysis of participant's qualification to ensure that training was neither too basic nor too advanced.
- Questionnaires modified - with a focus to include how training is applied to daily work situations.
- Questionnaires designed for follow-up interviews to be carried out through field visits as well as through the Project web-site - stressing usefulness of the project's training in their everyday work. Particular emphasis was placed on identifying specific level of catalyzing influence exerted by the trainees on their own professional activities and that of their colleagues and other parties, which might be concerned with problems discussed during workshops.
- Project Performance Indicators were added to assist with project evaluations.
- Methodology developed for data collection and analysis, as a follow up study, to determine the degree to which the training process promoted improved water resources management, environmental sustainability and/or regional peace-building.

Mid-term project evaluations were conducted in 2003 and 2004. McGill utilized an outside consultant to conduct an internal project evaluation in 2003. This was followed by a CIDA evaluation (2004) conducted by "IRIS - environmental systems Inc." Both evaluations were very positive; recommendation from the reports was incorporated into the project completion strategy.

The workshop participants gained skills and abilities that were very applicable to their daily works. In addition, many participants were actively engaged in regional and national water related projects in the region. The TC provided a valuable tool utilized by other projects; Examples of projects

are described below, including the role of TC ICWC in their accomplishment³:

1. Water Users Associations

Five years ago TC ICWC introduced new models for Water Users Associations with modifications and adaptations suited to different geographical regions having various climatic and social conditions. Pilot schemes were established initially, such as in the Ferghana Valley, followed by analysis of these schemes' performance and then expansion of their implementation into more areas of Central Asia, and into projects that are being sponsored by other agencies. To date, there are **1000** WUAs in the Syrdarya river basin alone, and hundreds of others in different regions of the five CAR. The number of farmer members in each WUA varies from 200 to 4000 or so. In each region, senior water managers trained at TC ICWC direct and assist with the successful establishment, modification and improvement of the WUA structures and operation.

2. Water distribution planning

Analysis tools and computer software for water distribution planning in systems and canals were developed and adapted initially at TC ICWC workshops in 2003. Subsequently water resources managers from the five CARs were trained in these techniques. Furthermore, the Ministry of Agriculture and water resources of Uzbekistan requested training to 50 personnel of six new established river basin organizations in these methods, and in 2004. The result of the transmission of skills and abilities in this discipline were very good, and to day the water distribution planning tools are being applied successfully on more than one million hectares of irrigated lands.

³ More detailed examination of the Project's planned and involuntary beneficial impacts outside the Project are discussed in Section 5

3. Classification of agricultural lands and their improvement

Several years ago the TC ICWC recognized the need for more accurate and comprehensive classification of lands and water resources for planning and management purposes. During other projects, such as the Best Practices Project sponsored by the IWMI and WUFMAS, the CIDA-ICWC workshops were used to develop and disseminate the details and protocols for the classification of agricultural lands at a very detailed scale, including soil types, fertilization requirements, irrigation requirements, and other parameters. In three years later the application of the land classification system was extended to additional projects, including those supported by the IWMI and SDC, with the essential assistance of water managers trained at the TC workshops. To date the classification system has been applied to over 65,000ha of agricultural land. Perhaps more importantly, the classification system on over 10,000 ha of this area has been financed by local farmer funded projects.

4. Water saving practices

In 1997 and 1998, SIC ICWC initiated agricultural water saving practices in projects such as WUFMAS and the European Union TACIS. These techniques were extended and refined in the IWMI Best Practices project. Subsequently through workshops held at the CIDA-ICWC TC, these tools were developed further and disseminated to many regional water managers. Today they are being applied successfully over a much broader area, including IWMI project in the Ferghana Valley, in the Amudarya river lowlands' development sponsored by the World Bank and Asian Development Bank, and their application extends over more than 230,000 ha of irrigated lands.

5. KEY PROJECT PERFORMANCE RESULTS (ACHIEVED WITHIN AND OUTSIDE OF THE PROJECT)

5.1. Results Achieved at Output and Outcome Levels

Since its creation, the Training Centre in cooperation with a number of regional and international organizations has developed an effective system of water and environmental management training courses.

With over **2000** participants to date, the Training Centre has given an impetus to a number of new programs in the context of regional cooperation over sharing and managing transboundary water resources of Central Asia. It has set the enabling environment for development and implementation of transboundary water management practical instruments. Moreover, the Training Centre has expanded region-wide to form a Central Asian water management Training and Information Network.

The TC ICWC Branches in Urgench (downstream of the Amudarya river – for water users from Turkmenistan and Uzbekistan), and in Osh (The Ferghana Valley – for water users from Kyrgyzstan, Tajikistan and Uzbekistan) were established to meet the particular training needs of water professionals and farmers - tackling the problems specific to downstream and upstream environs. There are now plans to organize additional TC ICWC branches in Tajikistan and Kazakhstan. The TC network has resulted in enhanced cooperative management of transboundary water resources. This is demonstrated by closer multi-sectoral interactions and good faith negotiations between the regions professionals.

The TC Project has achieved the desired project results at the output and outcome levels – this being confirmed by internal and external (CIDA) performance assessments. (See Table 1, Section 2). Questionnaires and interviews were used to gather information - - results to date have been overwhelming very positive.

A summary of the main project achievements are provided below:

- 2000 participants have received training at the CIDA-ICWC TC (Tashkent/Urgench/Osh). This does not include special speakers, staff from SANIIRI, ICWC, SIC-ICWC, workshop moderators, lecturers and others who attended (total of 200). (See Annex 8.3).
- The project has achieved a more equitable regional reach than proposed in CIDA Project Performance Framework (PPR). Several sight visits to the field by evaluation experts showed that several international agencies including USAID, SDC, IWMI, ADB, World bank and a number of other bilateral and interstate organizations use the facilities

and training materials developed by the project. The linkages with other agencies are very strong. The Project has exceeded the original planned reach in terms of number of identified stakeholders, and has successfully developed a comprehensive network of stakeholders at the inter-sectoral, inter-state and international levels.

- Monitoring and evaluation results have confirmed:
 - Training received was very applicable to participants' daily work situations.
 - Staff demonstrated the willingness and potential to transfer the knowledge gained to others.
 - Participants disseminated, and debated, the training materials at their workplace.
- The project has successfully:
 - Increased the capacity of government and basin authority staff (operations, technical, managerial levels) to apply reform skills and replicate training to others; increased the capacity and number of senior government officials, basin authority managers, and policy makers to promote the establishment of an IWRM principles and network in the region.
 - Promoted increased international dialogue and cooperation with respect to water resources through the institutional reforms proposed / implemented.
 - Increased the capacity of ICWC to expand the project results beyond the duration of CIDA funding.
- Prepared 336 trainers (facilitators) from the 5 CAR.
- The trainers (facilitators) have demonstrated the ability to:
 - Facilitate the workshop groups achieve specific outcomes. Promote active, participatory workshop methods (roundtable discussions). Stimulate dialogue and interaction between participants - not just between facilitators and the participants.
 - On the initiative of the TC, pertinent dialogues were simulated in mass media at regional, national and local levels.
- Skills obtained through training are used for works such as:
 - Organization of WUA and Canal Management Boards
 - Application of information systems and modeling for IWRM
 - Formulation and implementation of strategic plans for IWRM
 - Operation and maintenance of drainage and hydro structures
 - Development of National policy, strategy and action plans; Preparation of feasibility studies and project assessment documents; Drawing up of national and regional reports; Coordination of programs between different sectors and Ministries
 - Conceptions of basic principles of International and National Water Law

The above mentioned and other items (See Annex 1 for the full list of training topics) proved to be essential for capacity building in the water sector.

- As a result of this project there has been an increase in dialogue and the sharing of information between states. The project reach was broad-based and included:
 - Policy makers and political directorate
 - Water managers, water and environmental professionals, middle-level water managers
 - Jurisdictional specialists, foreign affairs staff
 - Farmers, and the NGO community
 - The dialogue and information exchange between the key sectors has contributed to increased interstate cooperation.
 - Workshop participants included many of the key players concerned with interstate water resources management.
 - The workshops also established new linkages between State Governments, Ministries, regional organizations, institutes, national and regional project management teams, etc.; this started enhancing the exchange considerably. The TC has provided a forum where acute problems such as interdepartmental relations and distrust among economic sectors were addressed. Public participation, inter-sector cooperation, and transparency in decision-making have been promoted.
 - ICWC's role as a regional think-tank has been realized.
- The above mentioned have led to better communication networks, information sharing, and interstate cooperation. The fact that conflicts have been avoided and constructive dialogue continues should be taken as a very positive sign and is a project success story.
- The core components of an integrated water management network are in place and further consolidation of IWRM principles got an appropriate momentum. The CIDA Water Resources Management Training Project has advanced the building blocks necessary for the implementation of IWRM, namely:
 - Public awareness and political will;
 - Stakeholder participation;
 - Capacity building and sharing of information;
 - Setting priorities and development of action plans;
 - Political support and adoption;
 - Legal framework.

Workshops delivered in 2000/2005 provided *lower level water managers* with increased skill and knowledge on topics including: water resources management (basin scale); environmental protection issues; gender considerations; water accounting and information exchange; managing water users associations; water law – ethics; safety of hydro-technical structures; Ferghana Valley - canal management automation; Ferghana Valley - development of extension

Middle-level water managers and technical personnel gained increased skills and knowledge on topics including: procurement; capacity building for the Aral Sea Basin drainage ; geographic information systems; assessment of current ecosystems of the Aral Sea Basin; soil and water resources management at the farm level; integrated water resources management in a transboundary area (inter-sectoral and interstate approaches); development of a strategic plan for the realization of the IWRM principles in Central Asia; integrated water resources management at the district level; results of the Project-Aral Sea and Aral Sea Coast; and advanced irrigated agriculture.

Most of middle-level managers are directly involved in policy formulations, development and implementation of rules and regulations within their organizations. The effectiveness of regional initiatives is directly related to their attitude and approaches to ideas of hydro-solidarity. So, it proved expedient to build partnership contacts between them through training events.

50 *senior Central Asian water managers* attended workshops held in Tashkent, Urgench and Osh, where they gained increased understanding of the benefits of open dialogue and the peaceful sharing of the regions' water resources. Two study tours to Canada by groups of senior water resources decision makers were most instructive on that score. Also, it should be noted that CIDA generously organized participation of water resources ministers from five Central Asian states in the 9th Congress of International Water Resources Association (IWRA) in Egypt in 1996, 10th Congress of International Water Resources Association (IWRA) in Canada in 1999, and the 2nd World Water Forum in The Hague in 2000 and in ICID Congress in Canada in 2002. These senior decision makers gained advanced knowledge of international water management institutions and treaties which enhance regional cooperation and a better understanding of how the project would contribute to this end. Senior water managers build better lines of communication through discussions relating to international water management and peaceful resource sharing. The Project resulted in their active involvement with the promotion of water reforms in the region and in 5 countries. (See Part 5.4. of this Section for description of the reforms).

Round-table discussion periods expanded and strengthened the dialogue network in the region. The "increased potential" to develop a sustainable discussion network has been transformed into a strong training centre network - 3 branches in operation, with 4 additional branches planned for 2005/2006. The senior water managers trained at the ICWC training centre have actively promoted increased dialogues between key Ministries and Institutions. Evaluation interviews with them indicated that information obtained at the CIDA-ICWC training Centre was, for the most part, not available elsewhere. Coordination on water allocation and distribution

in the Amudarya and Syrdarya rivers (especially between upstream and downstream states) has improved.

* * *

As pointed out above (see paragraph 4.2. Section 4), the Monitoring and Evaluation activities included involvement of a neutral outside evaluator in the M&E process – a consulting international company “IRIS – environmental systems Inc.”. Key findings drawn by IRIS are cited below:

- “The ICWC Training Centre network has become a focal point for water resource management in the region and is helping to create framework for identification and implementation of water reform and related agricultural reforms in the region...The TC has earned a reputation for the delivery of high quality training workshops and policy roundtables that involve participants from all 5 member states”;

- “Overall, project performance toward achievement of results at the output level has been good-very good...Significant progress has been achieved in the areas of increased understanding of peaceful water resources sharing, increase skills and knowledge of middle managers and technical personal, capacity building and ownership of project by the local partners”;

- “Overall, project performance in the achievement of outcomes has also been good-very good with significant progress in the areas of policy and institutional reform”;

- “Strengths: – Unique interstate and regional nature of TC ICWC is noted by many senior policy makers and donors during field’s interviews; excellent working relationship with the five Central Asian Governments; strong regional mandate. Broad spectrum of donor support, staff that is well trained (computers and programming, GIS, mathematics - modeling) and highly motivated; capacity to attract a broad level of professionals for training (policy, management, operations, technical)”.

5.2. Measures to Catalyze and Expand Project Implementation

The CIDA-ICWC Project evolved in an environment influenced by radical changes in the socio-economic structure of five newly independent states. Each state has varying rates and scopes of market reforms and different (sometimes conflicting), interests with regard to transboundary water uses in up-stream and down-stream areas. During the earlier stages of project implementation it had become apparent that it would be beneficial to expand the project reach and target groups. This spurred a “chain reac-

tion" involving new participants and partners as well as additional sources of funding allotted for TC activities.

Since its establishment in August 2003, the Urgench Training Centre Branch (Uzbekistan) has made significant achievements towards the expansion of the regional network. As a result, the overall project reach has exceeded planned targets. Topics of workshops held here reflected relevant regional and country-specific issues.

The Urgench TC broadened the reach of the project to include participants from Turkmenistan. The regional dissemination workshops were tailored to the grassroots water management level. Participants gained increased awareness on regional water management issues. Roundtable discussion topics included: water management reform; water demand assessment; water accounting and balance (Amu-Kashkadarya and Amu-Bukhara river basins); the establishment of watershed quotas; transition to the basin principle of water resources management (from an administrative-territorial one); water resources management in the Amudarya river; IWRM in the Amudarya river basin; hydro-structures and water accounting; and, WUAs' position in application of IWRM principles.

The establishment, in March 2002, of the Training Centre Branch in Osh (Kyrgyzstan) has also strengthened positive catalyzing effect in reaching the Project's objectives. This work is part of the SDC sponsored "IWRM-Ferghana Valley" project. The Osh TC branch delivered workshops where training focused on technicians, farm specialists, hydraulic engineers. Participants also included representatives from local/regional water user's associations.

As a result, the CIDA Water Resource Management project has provided grassroots water management personnel in Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan and Uzbekistan with increased awareness of regional water management issues.

Over the past 5 years, SIC ICWC and Brace Centre have accumulated experience and in-depth understanding of trainees' current needs. As a direct result, an array of self-teaching modules were prepared and distributed in 2003/2005. This was facilitated using the CIDA-ICWC training network. The self-teaching module topics included: water quality monitoring & control; project management; and Results Based Management Reference materials; mechanisms for enhanced regional cooperation; the importance of sharing of data and information, and technology of drainage on irrigated lands, to mention a few..

Other distance education materials prepared and distributed by this project included the following:

Legal collections on water law:

No 1 - Water laws in Central Asian countries;

No 2 - International Water Law;

No 3 - Constitutions and status of international organizations in the Aral Sea basin; No - 4 Water Law in different countries of the world;

No 5 - Constitutions of Central Asian countries;

No 6 - Land Law in Central Asia (vol. 1 - the Republic of Uzbekistan);

No 7 - International water law; No 8 - Land rights in Central Asian states (vol. 2: Republic of Kazakhstan, Kyrgyz Republic);

No - 9 International and National Water Law and policy;

No 10 - Selected juridical documents of the Aral Sea basin's states and UN;

No 11 - International Environmental Law;

No. 12 - Water and land law of the Republic of Kazakhstan;

No. 13 - Water and land law of the Turkmenistan.

Training Center workshop reference materials:

- Booklet about the CIDA-ICWC Training Center;

-Collections of papers for each workshop theme: for example

- Integrated water resources management (2 volumes);

- International and National Water law and policy

- Advanced irrigated agriculture in Central Asia;

- Environmental flows;

- World Water Council - perfection of water management;

-Training video related to the water resources management in Central Asia.

The Brace Centre has prepared and distributed 3 Drainage modules

- Mount Royal College has prepared and distributed: Train-the-trainer reference materials, and Accounting modules.

TC ICWC staff prepared revised training materials for each workshop topic. The TC, in cooperation with SIC ICWC, prepared a series of on various aspects of water management. The brochure titles are as follows:

1. Environmental flows
2. World Water Council
3. Perfection of water management in the USA
4. The International Commission on Irrigation and Drainage
5. The Ecological Management: the world experience
6. Something about Water in Canada
7. Sustainable management of groundwater: conceptions and tools
8. Strategic planning and sustainable management of water resources development in Central Asia
9. Water resources of Japan
10. Mainstreaming Gender in Water Management. A Practical Journey to Sustainability: A Resource Guide (UNDP)“ Climate Change is everybody’s concern
11. Climate Change concerns everyone
12. Collection of selected minutes of the Training Center’s workshops
13. Training module of water law
14. Finding capital for sustainable livelihoods businesses. A finance guide for business managers. (Required material for Project Management)

It should be noted that the TC ICWC publications introduced an array of foreign experience to the water, energy and ecology specialists in Central Asia. The TC also provides senior water resource management officials with up to date information on ICWC activities, and the results of scientific research conducted within SIC ICWC.

Training materials are prepared in CD-ROM format, and a CIDA-ICWC Training Centre Web page was established to enhance regional distribution. SIC ICWC maintains the TC’s web page where the results of each workshop are detailed. It is noteworthy that many of the training materials posted on internet site have been and used as reference materials by Universities and Technical Institutes in the region. In addition, a considerable number of thematically compiled informational and instructive CDs, produced on the initiative of the TC staff, have been disseminated throughout the region. Apart from the TC web site, SIC ICWC maintains 10 other web sites dedicated to the distribution of information on water related issues. A web site dedicated to gender issues is a new initiative - one Project success story. The web sites have expanded the distribution of the works of SIC ICWC within Central Asia and world wide.

To enhance computer skills and abilities of selected grassroots audiences (mainly local operators and water users) CD-ROM and internet courses oriented towards distance education were developed at the TC. This was followed by 10 practical training sessions at the TC facilities (Tashkent, Urgench, Osh).

In 2002/2004 the Training Center computer equipment was upgraded and simultaneous translation equipment purchased. Computers and state-of-the-art audio-visual equipment proved to be very helpful and was used regularly during training sessions.

Since the start of the project, in April 2000, the capacity of the TC had strengthened considerably. The number of staff had been steadily increased to keep pace with the demand for training. At project completion (December 31, 2005) the Central TC personnel included 6 full time and one part-time employees, namely:

project director; deputy director; coordinator/researcher; accountant; translator; office-manager; legal researcher-librarian; part-time computer technician.

Information sharing arrangements were monitored through workshop reports and other published reports. TC personnel demonstrated the willingness and potential to transfer the knowledge gained to others (training materials disseminated and debated at workplace). Workshop assessments show staff at Urgench, Osh and Tashkent TCs have very good capacity to transfer knowledge to others. The Training Center staff had been acknowledged as being motivated, well organized and has earned a track record for the delivery of excellent workshops (the wording is that of independent evaluators). A library and coffee-break rooms have been added to the training facilities.

Training Centre works included the establishment of a library where an immense collection of literature has been accumulated. The library collection includes 3,000 of research and reference books pertinent to land, water, and agricultural issues, recent international water/environment publications, relevant lectures and academy editions. Many books and journals were donated to the library by CIDA and McGill University, and the staff of SIC ICWC. The library is also supplemented with world-wide subscription publications – these contributed by SIC ICWC.

The Internet is used to keep workshop participants up to date on training activities. Workshop participants who have access to e-mail receive the latest news on a monthly basis including a monthly SIC-ICWC bulletin with brief minutes of workshops. Materials for every workshop are revised to add the latest information on relevant issues of water management.

Among measures to catalyze and expand the Project implementation - the efforts undertaken by SIC ICWC aimed to mobilize additional funds are especially noteworthy. SIC ICWC made *in kind contributions* towards the CIDA project works through out its duration - it should be noted that, by project completion, SIC ICWC contributions exceeded the amounts required by a significant amount. Concurrently, SIC ICWC persisted with a search for additional international donors capable and willing to support the training initiative. (See Annex 8.4. and Annex 8.5. for the full list of ICWC and donors' contribution).

5.3. Project Constraints

Discussions of the project results between Canadian and Central Asian partners revealed that achieved outcomes could be more far-reaching if water managers were more actively included into the decision making process. Training on water law and policy development had focused on personnel from the executive bodies responsible for water resources management. Unfortunately, higher government authorities (Cabinet of Ministers) were rarely available for training sessions. Decisions with respect to water (laws, legal interstate and intergovernmental contracts and agreements, protocol decisions) are under the full control of only the highest level of Governments. Extensive government restructuring is expected, therefore, to facilitate direct input from the lower levels.

The majority of Central Asian water policy makers/water managers have limited English language skills. This makes it a challenge to communicate directly with the project stakeholders. This has impacted the collection of monitoring and evaluation information from the field.

The telecommunication system in Central Asia is weak, and the cost for telephone / fax and e-mail services provided is high. The use of the internet, as the backbone for the communication network, was, therefore, less effective than anticipated. Most government personnel, not to mention WUAs and FWUAs, have limited access to the internet due to its high cost. The use of internet courses for grassroots audiences will therefore have limited application in future projects of similar scope. High printing costs has reduced the distribution of training materials at the workplace by participants. Tangible contributions are needed for development of a corporate water resources communication network with pertinent IP-terminals including those of Training/Extension Service focal points.

The poor economic conditions within Central Asia have limited the ability of cost recovery for the operation of the training centre. The Central Asian governments have other developmental priorities - this places a strain on National budgets and their ability to pay for training courses. For the immediate future, the Training Center will most likely depend on the international donor community for support.

5.4. TC ICWC's Activities - Other Results

In addition to strictly formalized planned results (Outcomes, Outputs, and Impacts) of the Training Project there is a multitude of overall and side-effects of improved human and institutional capacity, as well as far-reaching cumulative developments that have results from TC ICWC activities.

As noted earlier, the original design of the project focused on training of trainers and capacity-building of the senior and middle level decision makers and managers in the five governments. It is a tribute to the SIC ICWC that the project has been able to undertake training at lower levels (at the Province, District and Water Users Association levels). The important point is that the lower level training became possible through trainers and grassroots trainees prepared by the TC ICWC.

One immediate effect of this project has been to significantly increase the dialogue and the sharing of information between states. It is noteworthy to highlight that the CIDA-ICWC TC has provided the only forum for many stakeholders to dialogue and debate issues with government personnel. The project has successfully introduced roundtable formats as a new approach for consensus building and exchange of information and ideas. Consequently, the Aral Sea basin TC has played a significant role for introduction of policy-institutional reforms in the water resources management sector in Central Asia. It is important to underline that the ICWC TC became the first mechanism that facilitated dialogue, sharing of data and research information, and conflict prevention methods at the regional level. Roundtable discussions and policy dialogues encouraged senior policy makers and water managers to exchange views and discuss options for policy reform. This, in turn, has contributed to ICWC TC evolving into a "think tank" for water policy reforms in the region.

The potential effects of the Project are summarized in the following diagram:

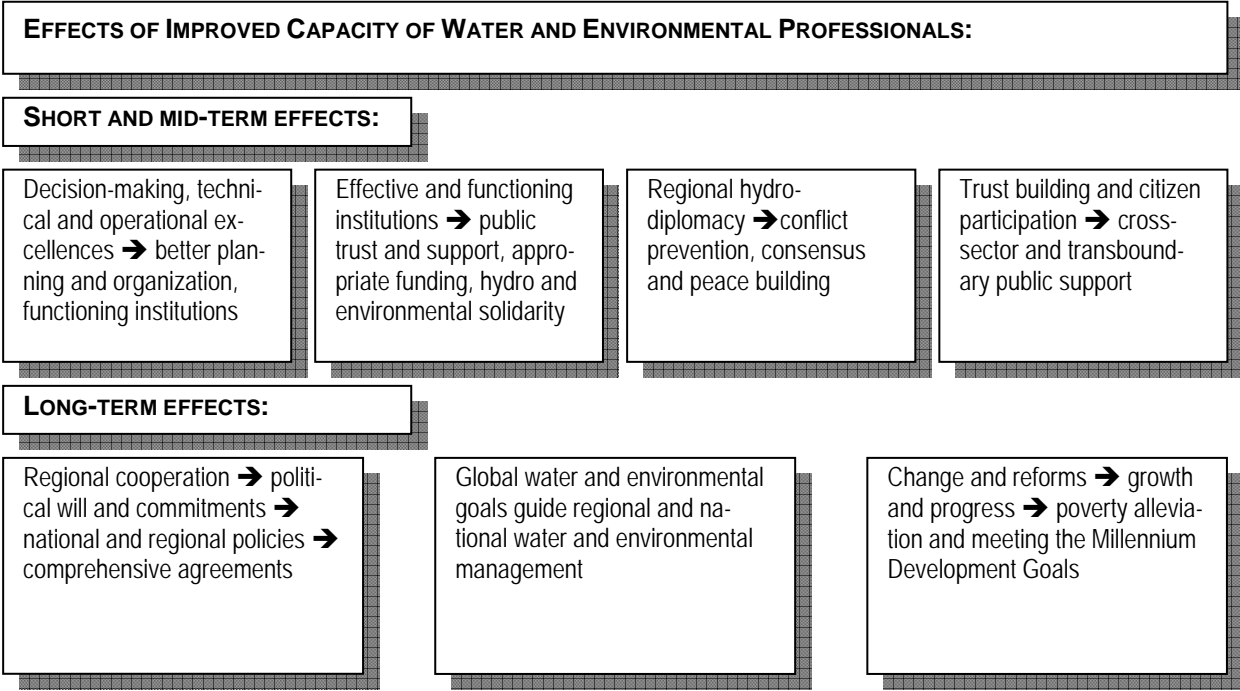


Figure 7. Effects induced by the Project

The Project has paved the way to policy dialogue in the region, making noticeable contributions to achieve settlements on serious conflicting situations. Exemplarily in this regard were the circumstances that occurred around the Chardarya reservoir fraught with flooding of large areas in Kazakhstan and Uzbekistan caused by water draw-offs. Round-table discussions organized within one of the workshops held at TC, with participation of ICWC members and heads of energy agencies, resulted in concessions to avoid grave consequences in the downstream of the Syrdarya River.

A series of TC workshops’ recommendations distributed among ICWC members later took the shape of national project proposals. For example, the participants in the workshop on “Water-Energy-Climate Dialogue” proposed a working group be formed to review the interstate Agreement of 1998 “On Management of Water Resources within the Syrdarya basin”, and draft a new regional document. Also, based on workshop appeals to the national governments and international sponsors - reorganization arrangements were introduced and advance hydro-meteorological equipment was supplied at observation posts on “Fedchenko” and “Abramov” glaciers, and USAID allocating funds for procurement of the technical de-

vices. Other examples include the introduction of measures to upgrade the SCADA system in the Naryn River basin and installation of similar equipment with support of SDC.

Since 2000 a variety of very positive policy/institutional reforms have been implemented in the countries of the Aral Sea basin - all of them rooted in themes promoted at the ICWC TC and with the participation of key water policy/decision makers. Among them, for example, are:

- Water Code of the Republic of Tajikistan (November, 2000);
- Dushanbe Declaration signed by the governments of Uzbekistan, Tajikistan, Kyrgyz Republic and Kazakhstan to promote improvements in trans-boundary water resources management and coordinated action on the basis of the principles and rules of international law (October, 2002);
- Decree of the President of Uzbekistan that outlines important trends in agricultural reform, including basin-level IWRM and water-market principles of irrigation-i. e. user pays (March, 2003);
- Water Code of the Republic of Kazakhstan aimed at improving water management in Kazakhstan (July, 2003);
- Decision of the Republic of Uzbekistan's Cabinet of Ministers on improving management in the water sector organizing it on the basis of new principles - transition from command - style management within boundaries of administrative districts to management determined by river basins and watersheds conditions (July, 2003);
- Water Code of the Kyrgyz Republic. New Water Codes passed by parliaments of Central Asian states reflect to various extents such IWRM principles as – basin approach to management, public participation, "polluter pays" requirement, priority of meeting human and ecosystems, demands for water and others. IWRM principles are most implicitly reflected in legislation of Kazakhstan and Kyrgyzstan (December, 2004);
- Ministerial regulations were accepted in Uzbekistan, Tajikistan and Kyrgyz Republic that promote IWRM in the Ferghana Valley;
- Interest has been lately generated to resume the work of the Inter-Sectoral Conciliatory Commission to develop drafts of inter-state water agreements (2002-2005).

Progress has also been achieved in the legal regulation of WUAs' activities. For example the Law on WUAs was passed in the Kyrgyz Republic, and in Kazakhstan relevant provisions are stated in the new Water Code and Law on Agricultural Consumers' Co-operatives. Preparations are also under way in Tajikistan and Uzbekistan to draft of Law on WUAs - many clauses of which are outcomes of experience exchange with Kyrgyz and Kazakh colleagues during training sessions.

Many workshops covered the issues of transition to a market economy, including economic tools of water use management, distribution and allocation of water resources, economic incentives to introduce advanced water conservation and saving methods as well as a "polluter pays" principle. A series of training sessions were devoted to discussions of positive and negative impacts caused by introducing payment for water use, civil jurisdiction in relations between water users and water saving methods of irrigation. The trainees could see for themselves that these approaches were most effective at the level of WUA under support on the part of the government in the form of reduced taxation and preferential crediting, and participation of the State in rehabilitation of on-farm irrigation and drainage systems.

One of the most valuable results achieved lie in the fact that the Project has set going the process of propagating IWRM principles in Central Asia. Currently, IWRM is broadly implemented in the Ferghana Valley; new linkages between hierarchical levels of management (WUAs, Canal Water Boards) are tested and developed on the basis of hydrographical principles and a participatory approach through social mobilization. Similar works are also underway in the downstream zone of the Amudarya River. The works executed within the training project facilitated the adoption by the government of Uzbekistan a state regulation about transition of whole water management of the republic to basin principle of water resources management, meanwhile in Kazakhstan, principles of IWRM were included in the national Water Code. Through implementation of IWRM principles, Canal Water Board (a new institutional structure) has been introduced by the Osh TC branch.

Thus, the Project has made significant contributions towards increasing the capacity of governments, basin authorities, and other institutions to promote the establishment of IWRM networks within the five CA Republics. However, the rates vary significantly between countries. In this connection, the Tables given below reflect the situation as to promoted by GWP "Building Blocks" necessary for the implementation of IWRM, and insight, into the complexity of the process that should be given additional consideration in future regional round-table sessions.

The 5 key Building Blocks for IWRM were identified as:

- Public Awareness and Political Will;
- Stakeholder Participation;
- Capacity Building and Sharing of Information;
- Setting Priorities and Development of Action Plans;
- Political Support to Reforms towards IWRM.

Country Progress Report: Integrated Water Resources Management “Building Blocks”

I. Public Awareness and Political Will

Kazakhstan	Political will and support obtained in the result of the National referendum in 2000
Kyrgyzstan*	Parliament initiated awareness campaign via mass-media in 2002
Tajikistan	The President claimed priority for water issues in 2000 from the UN forum
Turkmenistan	Mass-media campaign monitored by Government
Uzbekistan	Government started awareness campaign in 2003

II. Stakeholder Participation

Kazakhstan	Country Water Partnership was established in 2003
Kyrgyzstan*	Special Parliament Group coordinates inter-sector relations
Tajikistan	Vice-Premier coordinates inter-sector water use
Turkmenistan	Government coordinates inter-sector relations
Uzbekistan	National Water Council promotes IWRM in 2003

III. Capacity Building and Sharing of Information

Kazakhstan	State Water Committee and CAREC coordinate national program
Kyrgyzstan*	Department of Water Resources created training network and support to WUAs. Branch of ICWC TC in Osh city
Tajikistan	Branch of SIC ICWC in Dushanbe coordinates training activities in the region
Turkmenistan	Ministry of Water Resources coordinates special program
Uzbekistan	Training network with CIDA-ICWC TC in Tashkent, branch in Urgench and Department of Water Resources

IV. Setting Priorities and Development of Action Plans

Kazakhstan	State programs for water sector and water supply and sanitation started in 2001
Kyrgyzstan*	Parliament adopted National Water Strategy
Tajikistan	National Water Concept was adopted by the Government in 2001
Turkmenistan	National Strategy of socio-economic reforms (to 2010) adopted by the Government
Turkmenistan	National Master Plan for water sector was adopted by the Government in 2002

V. Political Support to Reforms towards IWRM

Kazakhstan	Governmental commitment to IWRM confirmed and secured in Water Law
Kyrgyzstan*	Governmental commitment to IWRM confirmed process monitored by Parliament
Tajikistan	Governmental commitment to IWRM confirmed
Turkmenistan	Formal support for reforms from Government
Uzbekistan	IWRM principles supported by Ministry of Agriculture and Water Resources

* Status in Kyrgyzstan based on data before 2005 regime change

Concurrently with regular scheduled training sessions, the TC staff prepared and held in cooperation with international and regional organizations several large-scale events acknowledged by many participants as being very useful in terms of strengthening regional cooperation in trans-boundary water resources use and new knowledge buildup. Among them are: - three conferences in Almaty, Kazakhstan, Bishkek, Kyrgyzstan and in Tashkent jointly with FAO.

Among other accomplishments of the Project there are such activities generated by the Training Center as organization of the International Forum dedicated to **"The Year of Freshwater"** held in Dushanbe (Tajikistan) in 2004. TC ICWC's staff, facilities, organizational potential and wide professional contacts were very engaged in preparation of Central Asian delegation for participation in WWF-3 (with generous ADB support). And at present, many make use of TC network to present information to be included in the SIC ICWC web-site within the framework for the WWF-4.

Bearing in mind all efforts undertaken by TC along the lines of strengthening international ties and dissemination in the region experience accumulated by word water community one can rephrase the proverb "Traveling is a window on the world" - with reference to the CIDA-ICWC Project - as "Training is a window on the world"

Many international organizations have acknowledged that partnership with the TC has permitted them to develop good working relationships with line departments and agencies in Central Asia. As a result, they have been able to launch pilot projects with sectoral departments in the region. This is significant as there is now potential to extend the pilot/demonstration projects to other locations in Central Asia. The replicability of best practices (successfully tested in action as applied to reclamation, irrigation, water saving, planning of water use, community social mobilization, etc.) and on-site training will be important aspects for future development. The important effect of the pilot projects is that they also provide an opportunity for the local water users to participate in decision making and develop advanced skills necessary for irrigated agriculture in market conditions.

The knowledge sharing potential of TC and its branches is utilized in executing a number of other donor funded regional projects. For example, SIC ICWC in cooperation with UNECE/SPECA and office of UNEP/GRID-Arendal in Geneva is executing the Project on *Central Asian Regional Water Information Base* "CAREWIB". One main goal of this project is the development of a regional web-portal containing regularly up-dated information on the water management situation and environmental issues in Central Asia. ICWC utilizes the TC's database along with information accumulated by other interstate organizations for the "CAREWIB" portal - within ICWC jurisdiction.

The TC has taken on the important role as a kind of "ad hoc committee" for drafting of long-term interstate agreements on the equitable, reasonable and sustainable use of water resources in the Aral Sea basin.

The CIDA Project successfully brought attention - to the world community- of ICWC as an important regional institution - this has enhanced its prestige credibility within international water community. SIC ICWC has also gained considerable credibility and confidence from government and non-government organizations - this facilitated project implementation. As a result, recognition from other donors has led to additional financial support for training. Cost saving's permitted, for example, the CIDA's funds to be used for equipment purchase at the Urgench TC. Donors continue to contribute funds for ongoing training.

The CIDA Project became *ipso facto* the pioneer in organizing inter-state water training in the Aral Sea basin. The advent and activities of the TC generated broad awareness and popularity between water professionals, donors and specialists of different directions – forming favorable opinions on “Canadian-ICWC Center of Excellence”. This format was later replicated by other donor projects and programs in Central Asia (USAID – Academy for Educational Development (START/AED), NRMP, OSCE. The CIDA-ICWC Project model also prompted the Kyrgyz Ministry of Agriculture, Water Resources and Processing to establish with support of World Bank a Republican TC in Bishkek. s. Similar

Training Centres are planned for in Dushanbe (Tajikistan) and Almaty (Kazakhstan), and more recently three “training focal points” were set to start in Andijan, Ferghana (Uzbekistan) and Hodjent (Tajikistan) - the focal points in response to the training demands of local farmers.

The before mention are based on a very productive and useful combination of training activity (style of education) with permanent flow of new scientific findings of SIC ICWC. This expansion was initiated through the ground works of SIC ICWC where much credit is due for their vision and on going support for similar initiatives. The CIDA Training Centre and SIC ICWC have co-published a wide range of water and ecological brochures, books, leaflets, and CD ROM describing Canadian and other experience in advanced interrelation between Society and Nature. This has spurred interest and dialogue through out Central Asia.

Knowledge gained by TC ICWC staff - through McGill’s example has been passed on to other regional and national water organizations. As a result, these organizations have better ability to manage international programs supported by donors, and make adjustments according to the local conditions.

Round-table sessions and on-site training between participants and TC staff identified education on water issues as a priority. Bringing water issues into public schools and colleges in Central Asia provides a means to encourage young people to understand not only the wider concepts, but also the effects of their own behavior on water, its quality, and ecosystems. The CIDA-ICWC Training Centre initiated works in this direction in cooperation with the republican Ministry of Higher and Specialized Secondary Education. A plan to build up the capacity of school teachers to develop educational materials “on environment and water” was completed in 2004. . This was later reworked into a project proposal recently submitted for consideration of Western donor agencies working in the region. The CIDA-ICWC Training Centre has also started participating in the educational “EWASIA” program to develop International Master’s course on *Environmental Policy and Science* for postgraduate students in Tashkent Institute of Irrigation and Reclamation.

Three zonal workshops were held at the Central TC and its Branches (Tashkent, Urgench, and Ferghana) in November-December, 2004 in order to get input from the public with respect to the proposals for "School Water Education in Uzbekistan". Representatives of all (13) provincial Departments of Public Education discussed measures to involve schoolchildren in water resources saving and conservation activities and put forward a whole array of suggestions to be executed in 2005-2006. Many of these activities have now been incorporated into pre-school, primary, middle, and high school curriculums; this is being followed with great interest and coverage by the mass media.

6. LESSONS LEARNED

Through participation in the CIDA-ICWC Project its Partners and Stakeholders have acquired valuable experience in IWRM capacity building and learned a number of lessons. TC and SIC ICWC staff gained knowledge through McGill's example on how to manage and deliver programs in the long-term, using state-of-the-art equipment. There are hopes that the information accumulated for five-year duration of implementing the Project might be of use for practical application along these lines in future efforts by IWRM community; some of the lessons learned might be given consideration by members of GWP family engaged in its global **Framework for Action** program for the 21st century.

Main lessons learned include:

The close cooperation **between CIDA and local regional partner - SIC ICWC has proven to be extremely valuable and the prime element for the success of the project.** While implementing TC Project, as any other regional projects in general, it turned out to be important to develop **partnership with national key and influential stakeholders beyond water sector** (Ministries/agencies of Energy, Nature Protection, Foreign Affairs, Justice, NGOs); as well as, **partnership with working in the region international organizations** – such as (in the case with the CIDA Project): - GWP, IPTRID, IWMI, USAID, DFID, SDC, GEF, Dutch Ministry of International Development, Swiss Technical Cooperation, Dundee University, McGill University, UNESCO-IHE, Bonn University, Stuttgart University, Montpellier University and many others;

The above listed agencies were able to capitalize on the CIDA Project infrastructure, and the experience gained by ICWC. One beneficial development was that the Project has attracted recognition from other donors who started contributing funds for training. This has permitted SIC ICWC to **launch a number of pilot/demonstration projects - with on site training - at a number of locations in the region.** The use of pilot projects as a training tool is key for the promotion of new ideas in the region.

Pilot projects incorporate training of locals which enhances their decision making abilities and cooperative spirit. The replicability of best practices and on-site training promoted by the CIDA-ICWC TC will be important for the future development of the water sector

Adequate and well coordinated international donors' financial support is indispensable in order to establish and build an effective Training/Information Network. The network will provide an essential means for GWP to promote and implement IWRM in the region.

Regional and even international programs can be as useful and productive as programs that focus only on a single country or limited area;

The development of a state-of-the-art communication (Internet, IP telephony, etc.) between stakeholders at the local, national, and regional levels is a prerequisite to maintain adequate information exchange, and to establish self-sustainable **Training/Extension Services** (WUAs-farmer-oriented) capable of quick response to the daily needs of newly-born private agricultural businesses;

Broader involvement of NGOs and public opinion should be considered as helpful measures to increase project implementation efficiency. . **Participatory** mechanisms, such as the inclusion of NGO's and public representatives at project proposal stages, would provide more widespread support of land/water users. This would no doubt streamline implementation of project activities at the local level.

The Brace Centre (McGill) underlined the following lessons of significance for achieving practical results:

- local partners need to be involved with the development of the performance measurement framework at an early stage of project design;
- More attention should be paid to selection of indicators used in Results Based Management (RBM) framework. The local partner staff should receive training in RBM and project management before the start of project activities;
- The value of good relationships with the local partner is especially important for projects in Central Asia;
- Accounting standards in the region are low. Accelerated transition to international standards may be unrealistic;
- It would be best to incorporate gender equity measures as a separate activity;
- Baseline data and qualitative indicators selected should be kept simple and easy to collect. Adequate funds need to be allocated in the project budget to collect this data;

- Project outcomes and impacts should reflect achievable results given the level of funding and the socio-economic and political realities of the region;
- Project management works are less efficient due to poor communication linkages (telephone and internet), government bureaucracy, language, and accounting standards;
- For the immediate future there is little prospect for a substantial change in terms of the economic circumstances in the Aral Sea basin. The strategy for the sustainability of similar projects' results and future donations should reflect this possibility.

There are some lessons learned as applied to **training methodology** expedient for water professionals and water users at the on-farm level:

- Training of senior managers (e.g. in the value of IWRM and recent water innovations) can help ensure capacity building throughout the organization, and support for training of junior staff. On-the-job training is highly effective as a learning tool and agent of change in large water organizations;
- Experience shows that successful courses to train trainers combine practical activities with classroom learning experiences;
- The effectiveness of training programs can be increased if target groups of people who regularly work together are trained together;
- Training of trainers requires extensive practical experience by the instructor but it is a cost-effective capacity-building tool;
- Trainers do not require a high level of technical capability in such topics as how to construct GIS, develop explanatory models, or select the best equipment, but they do need to understand the management of institutions and organizations;
- Emphasis is to be given to the development of individual responsibility, to realism, to meaningful information, to stating and explaining purposes and objectives in an understandable way, to discussions with ultimate water users, to communication, to changing mentalities, and at the same time to show that together through regional cooperation the problems can be solved to the satisfaction of all.

Participation of TC staff and utilization of TC training facilities in activities carried out by IWMI, SDC and SIC ICWC within "IWRM – the Ferghana Valley" Project and **pilot-demonstration sites** helped identify the following lesson pertinent to training:

- Knowledge of the social system of a particular setting is vital before designing activities enabling project staff to interact with water users and water managers to assist and **train them in formation of Water Users Associations** and Water Users Federations to manage their re-

spective hydro-systems in the framework of partnership and cooperation.

- Information is needed on social structures, gender issues, stage of economic development, human and technological resources and managerial capacities of water resources managers.
- After the formation of WUAs, **representatives of the WUAs should be trained** in related activities. The **training program should be focused** on subjects like:
 - Flow management;
 - Organizational management;
 - Financial management;
 - Record keeping;
 - Framing of by-laws;
 - Methods of mobilizing resources for the system operation and management.
- The important aspect to be considered is **provision of competent and experienced trainers**.
- The **training should be a continuous process** and be conducted down to grassroots level organizations.
- **The farmers' representatives and WUA staff trained at higher level organizations should be used** as resource persons for lower tier organizations - because farmers learn more from their fellow farmers.

The **Principle Lesson** learned in the course of implementing the Project:

For successful capacity building for IWRM in the Aral Sea basin **there is no substitute for a well-designed and managed training/information regional network. The network must be highly adaptive to the farmers' needs and responsive to current/future rapid and drastic changes** in political, economic, social and climatic environments. This will enhance the development of sustainable irrigated agriculture in Central Asia – this being critical for the survival of the local population.

7. PROJECT: COMPLETED. STARTING POINT: FUTURE

7.1. Success of Training Project - Willingness to Meet Challenges

The unique training initiative undertaken by CIDA and ICWC has been a success story. The most valuable outcome of the Project is having put in place a practicable regional Training Network with high human, institutional and technical capacities ready to be applied, on a long-term basis, to secure future sustainable development in the Aral Sea basin. The essence of the Project was to create a broad intellectual framework for reform in the water and agriculture sectors.

In this connection, it is appropriate mention here the opinion expressed by Mr. **Koichiro Matsuura** - the Director-General of UNESCO who underlined in his Preface to the publication of *"A Water-Related Vision for the Aral Sea Basin (for 2025)"* that UNESCO aimed *"...to use the Vision Document as a basis for continuous and broad consultation leading to actions in the Aral Sea region that will help secure it bright and sustainable future."*⁴ The UNESCO *Vision* recommends six prime measures to achieve such Future, placing high emphasis on **Education and training** (water-related), so that:

- "...In 10 years the kind of engineers who can implement the Vision are educated";
- "...literature on the water subjects has to become available and distributed to Universities and through professional societies";
- "...A specific education for farmers is to be designed and implemented to create the kind of farmer that can make a profit and at the same time implement a sustainable irrigated agriculture with an optimal yield per cubic meter of water."

The UNESCO *Vision* (presented at 2nd WWF in 2000) also stressed that the actual improvements in irrigation, water supply, and sanitation *"...will have to be prepared, planned and executed by the engineers and related scientists. They are in the region and are quite able to organize those themselves. **They need the instructions, the framework and the means...**"*⁵

⁴ Preface by the Director-General of UNESCO to the publication *"A Water-Related Vision for the Aral Sea"*, UNESCO, Division of Water Sciences with cooperation of the Scientific Advisory Board for the Aral Sea Basin (SABAS), France, 2000

⁵ *"A Water-Related Vision for the Aral Sea"*, UNESCO, Division of Water Sciences with cooperation of the Scientific Advisory Board for the Aral Sea Basin (SABAS), France, 2000, pp 108-109

The instructions, the framework and the means – these were exactly what have been initiated within the CIDA-ICWC five-year “Water Resources Management Training Project in Central Asia”. This project generated **synergy** through the collective efforts of experienced engineers, scientists, senior water policy decision makers, water managers at all levels from all Central Asian countries. The instructions, the framework and the means – these components still remain vital to sustain the Training/Extension Service Network in the Aral Sea basin for future use.

The challenges ahead is to implement water, agricultural and market reforms in the Aral Sea basin, given the widely varying economic and political status and conditions of the five CAR. Measures are to be taken to overcome obstacles and achieve fundamental changes. There is increased demand for more informed decision making, knowledge and skills; adequate training and education provide support for the creation of the “enabling environment”- this being underlined in many GWP publications on IWRM.

The CIDA-ICWC training initiative has laid a solid foundation for the implementation of IWRM by providing water users with reliable appropriate knowledge on an on-going basis Immense work has been done; participation in this work has helped bring together hundreds of people from different walks of life – water management professionals and scientists, social mobilization workers and farmers, diplomats and NGOs’ members – all living in different countries but united by commitment, adherence to principles of hydro-solidarity and great hopes for successful addressing future imminent challenges of increasingly changing socio-economic environments. The participants of the Project also hope that results of their efforts have constituted only the beginning – that present and future generations will be grateful to reap the fruit of their constructive endeavor.

Yet, one can draw many examples when the saying “*a good beginning makes a good ending*” proves to be sometimes wrong – this, unfortunately, may be referred to some international and local water-related projects in the Aral Sea basin, too – the projects that started evolving with prospects for the future under big fuss and loud cheers and in the end turning out to be “much ado about nothing” with not a sound of regret to be heard. Also noteworthy in this context referring to some projects conducted in Pakistan – various donors have been for decades imposing here different approaches to combat soil salinity beginning from the 1960s in the form of SCARP systems (projects - from №1 to №6). So far, these efforts have failed to solve the salinity problem faced by this country.

Many similar failures of good intentions took place not because of being ill-designed but due to lack of true adherence to IWRM principles and moral fundamentals of hydro-solidarity, as well as to insufficient insistency in proceeding with ***follow up advancements of the initial results***. One can also perceive in those cases lack of willingness to meet imminent

challenges, force of habit to live just for the present moment, incapacity to foresee future changes and needs and underestimation of necessity to constantly augment human adaptability to future developments through training – that is, as in our case, to prepare people for fruitful roles in a market-oriented society.

7.1.1. What kind of a follow-up to TC Project is required for the future?

To explore the current and future demands for training it is useful to examine the trends and patterns of future development of transboundary water resources in Central Asia. The findings made by GWP and the experience accumulated in SIC ICWC clearly illustrate the importance of training. More specifically, the need to increase the application of IWRM principles to share knowledge for the equitable, efficient and sustainable water resources management. The Aral Sea Basin needs a “future-oriented” Training Network that would not only transit skills, but would show how **advanced agricultural methods and modern information technologies** are applied in life under changing socio-economic and natural environments. The future Training Network must make provisions for continuous training on a “plug-in/plug-out” basis.

Analysis conducted by ICWC reveals the following arguments reinforcing these findings.

- The demand for training throughout the region reaches up to 2000 trainees per year;
- The created spirit of mutual understanding and water management cooperation from generation to generation needs to be maintained and reinforced on a constant basis;
- Improvements in land and water productivity are on-going and require continuous exchange of knowledge and ideas.
- A large number of farmers in Central Asia engaged in irrigated agriculture (especially new individual private land owners) have no prior experience. Demand for practical knowledge and methodological support is so great that in fact they desperately need to have in place a multi-branch regional and national net of Self-sustainable WUA-farmer-oriented Extension Services capable of quick response to their day-to-day needs.

A reliable updated framework for this kind of advanced future-oriented training needs to be build up without delay, while retaining, applying and developing through existing TC facilities all positive results accomplished by the CIDA-ICWC Training Project.

The Future Training Network will be able of focusing on the following spheres of activity:

- Integrated Water Resources Management at all levels - including rural community, WUAs, and on-field water use;
- Advance technologies in Irrigated Agriculture to be applied within the framework of Training/Extension Services;
- Participatory approach to Water Management and Planning. Stakeholders Capacity Building;
- Development and introduction of advanced *Information Management Systems* (Application of GIS and Remote Sensing in Water Management and Irrigation);
- International and National Water Law. Inter-sectoral cooperation;
- Gender and Water.

7.1.2. Future gender-specific training activities

As stated above, the participants of CIDA-ICWC Training Program in general, and TC staff in particular, recognized necessity **to ensure that water sector activities are gender-responsive at policy and institutional levels.**

Therefore the Future Training Network will promote the integration of gender concerns in policies, plans, programs, and projects implemented in the Aral Sea basin through training events and information sharing. First of all, more gender-specific comprehensive data are required in the water sector since women are important water users, as well as managers of water for family nutrition, hygiene, health, and community activities. Equally, women are development agents, professionals, and decision makers in water sector activities. Women's ability to participate more effectively needs strengthening through separate programs targeted at educating women, empowering them, enabling their involvement in community-based decision making.

The future training/information services delivered, for example, to WUAs' members would incorporate the following key elements of gender approach to planning, implementing and evaluating water sector activities with participation of women:

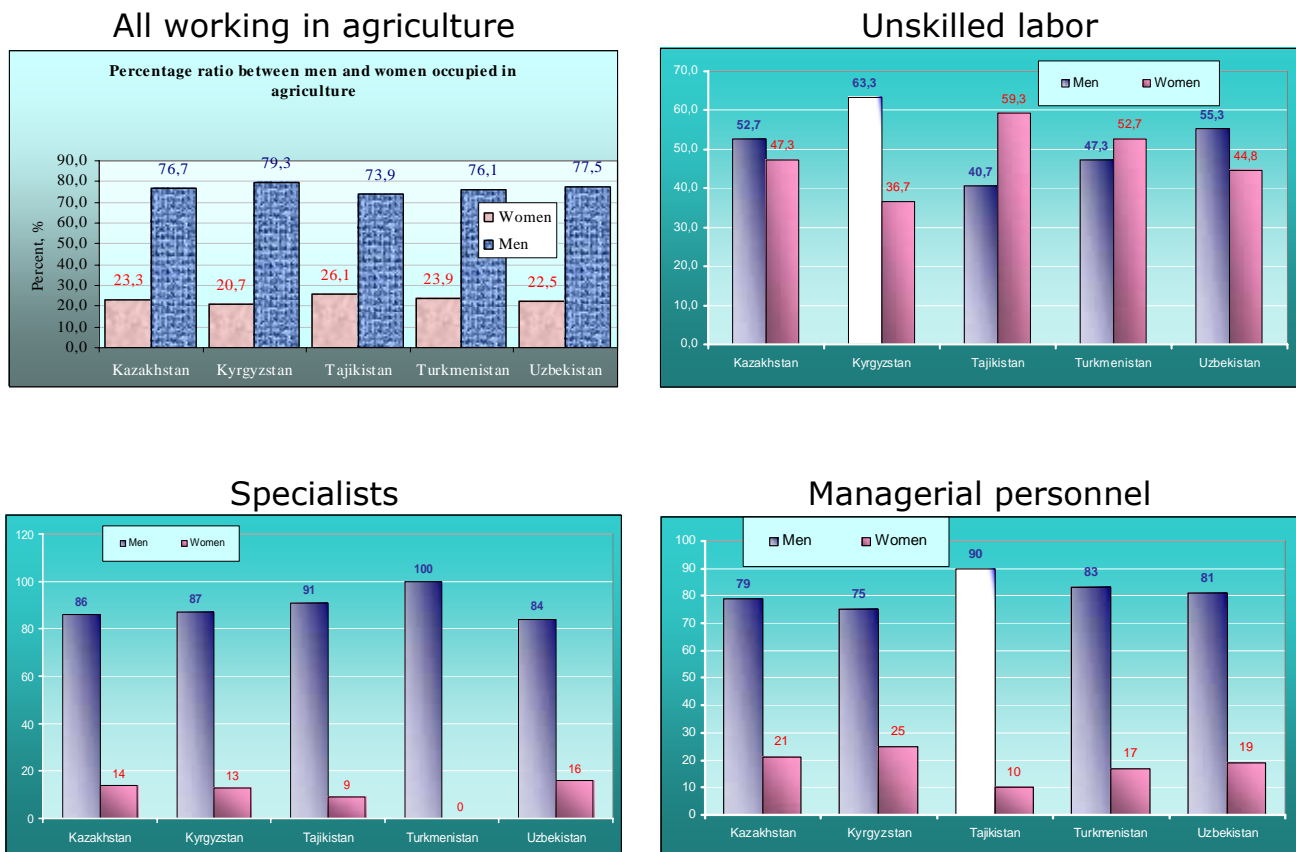
- Including a gender analysis at the design stage prior to the activity approval;
- Incorporating clear gender equity positions in the objectives and scope of the specific activity;

- Placing necessary data in monitoring and management information systems along gender lines.

Such approach to gender aspects in training will surely promote, in the long run, more active participation of civil society in identifying needs and issues, designing solutions, and establishing mechanisms for monitoring and resolutions of problems. Some general ideas on current GE situation in the Aral Sea basin are depicted in (Fig. 8).

Fig. 8. Project at first gave understanding to problem “Gender and water” in Central Asia and the role of poverty alleviation

Ratio between working men and women



7.1.3. Capitalizing on future training activities

In the future, existing knowledge sharing potential (facilities, staff, and equipment) of the Training Centre, and its branches, are to be more actively utilized to design and deliver tailored courses for people who are

engaged in various international, regional and local water/environment-related projects. There are currently (December 2005) over 20 large water/environment-related projects being implemented in the Aral Sea basin region. As noted earlier (See part 5.4) the TC has been very active in the CAREWIB project. CAREWIB is of significant value for future training and knowledge dissemination, since it implies maintaining contacts with outside sources of information on water, energy and other natural resources in CAR, with NGOs as well as different entities possessing policy findings (SPECA, REAP, ENVSEC, etc.) - this updated information will be of great benefit to future trainees. CAREWIB has already organized the regular dissemination of publications and e-info; this information has been directed to decision makers, NGOs, and the public at large that make regular use of regional training network.

The TC staff and SIC-ICWC have been able to receive special training through works done in association with many progressive and advanced programs. Examples of programs include:

- Water and Education – OSCE;
- Water and Land Productivity – EU FP-6;
- WUA development - ADB and World Bank
- UNESCO-IHE;
- Water and Governors – UNDP;

The CIDA TC project provided TC and SIC ICWC special training on topics including:

Gender and Water; Project Management; and the development of Business Plans. The long-term sustainability of the training centre was explored, options considered, and short-medium-long term strategies developed. This work was done in close cooperation with specialists provided by Mount Royal College. Strategies focused on utilizing the Center's capacities, management, staff and facilities to earn revenue and attract investors. However, it became clear that it was unrealistic to expect the TC to become self-sufficient within five years- especially given the weak transition economies in Central Asia. In the short-medium term (until the national and regional economies are stronger) the TC will need to rely on donor support to sustain and develop the existing training network.

7.2. Today's Donors are investing in the Future

The message of imminent water reforms in countries of the Aral Sea basin is for everybody, not only policy/decision makers, professionals, NGOs, and farmers - but particularly those organizations and personalities who have the willingness and means to help the peoples of Central Asia turn their aspirations into reality. The current water crisis challenges those di-

rectly affected by it to initiate action - to call on the international financial institutions (IFI), charitable foundations, governmental and private donor-organizations to assist in bringing together all groups of stakeholders affected by our water crisis through financing the regional Training/Extension Service Network – in other words, to “invest in the future”.

The international financial institutions have played a pivotal role by providing financial assistance and on-going support for the Global Water Partnership and Global Environmental Facility. This support has been important to sustain the dissemination-on a global scale - of advanced experience on water management issues. There is no doubt that efforts made by donor organizations, both bilateral and international ones, are of great significance especially with respect to advanced technologies, computerization, informatics and sophisticated methodologies. ***The newly independent countries of Central Asia could not have managed without their valuable assistance.***

The sustainability of the Training Centre network will be determined, in part, by the ability of ICWC to generate revenues to support future training programs. As mentioned above, there has been widespread donor support which has translated into significant financial contributions. To date donor support has been received from: SDC, GWP, IWMI, USAID, DFID, GEF, and Dutch Ministry of International Development, UNESCO, IPTRID, FAO, World Bank; EU, ADB, NATO, Dundee University (Scotland, Edinburgh), and others.

The future relations with members of GWP family are subject to hopeful deliberations in terms of allotting tangible contributions on their part to meet on-coming challenges in the domain of providing water users with advanced training. Large expectations on that score are generated among water professional in the Aral Sea basin by the **GWP global Framework for Action program** for the 21st century. As is known, one of the central elements of this program refers to ***Key practitioners to operationalise IWRM***, stating that “...GWP will work with key practitioners/champions to facilitate and enhance necessary change processes and piloting of IWRM thus achieving “action on the ground” and create models of IWRM implementation for others to follow.”

The TC and SIC ICWC have been quite successful capitalizing on the momentum gathered by GWP with regard to water-related activities in Central Asia. A number of workshops, round-table talks and discussions in the region were sponsored by GWP. The Honorable Margaret Catley-Carlson (Chair of GWP) visited the TC facilities in 2003 and advised on the ways to improve training activities - in particular, to pay more attention to Gender equality issues.

The present review of CIDA-ICWC Training Project gives a good opportunity to apply with the appeal to GWP for assistance in identifying perspec-

tive donors-partners for future development of IWRM Training Network in the Aral Sea basin within the framework of GWP *“Forming alliances for provision of services through Associated Program”*, which implies possible “...financial flows in water...”

SIC ICWC has moved forward and prepared feasibility study materials and draft documents to discuss with interested donors and sponsors – some of the materials have been transformed into proposals and submitted to donor organizations for consideration.

The world community places high emphasis on donors’ support to finance water infrastructure. This is demonstrated by the insight to invest in “future of human development” and expressing the need to augment this kind of tangible assistance world-wide. The report of the Panel on Financing Water Infrastructure (The Camdessus Panel) at the 3rd WWF (Kyoto, March 2003) clearly showed that current investments in water management – 75 billion dollars – is explicitly not enough to solve the world water problems. According to the “Vision of Millennium” the investments should be increased by 2.3 times – up to 180 billion dollars per year; the total amount for the period ending 2025 should total 4.5 trillion dollars.

The same report noted that international donors make relevant investments in the amount of 9 billion dollars every year. The significance of these investments for developing countries and countries with transitional economies is great, but effectiveness of the sponsorship could have been much higher. This conclusion, can in full measure, refer to the importance of financing a system of IWRM training and education – this essential to support and maintain the existing infrastructure. The agenda of the Fourth World Water Forum to be held in March 2006 can well serve as the Guiding Lines for this kind of donors’ support.

The principle theme of the 4th WWF - “Local Actions for a Global Challenges”⁶ is very well aligned with the request for international investment for the future development of the Central Asian Training/Extension Service Network. As indicated in the Preparation Program for the 4th WWF, “...today the main task is to involve local actors in social construction of Water Vision and **organization of international support for institutions and networks engaged in specific local activities** ...”. And it is not by accident that the list of items contained in the Preparation Program concerning *Problems corresponding to global challenges* represents in itself main directions of training activities for the foreseeable future. For example consider the following: *Cross perspectives corresponding to local actions*: “**A1/B1 (IWRM and Institutional development, rights and political processes)**” – for GWP; “**A1/B2 (IWRM and Capacity building and social training)**” – for ADB; “**A1/B4 (IWRM and Models of financing local water initiatives)**”- It would be impossible to

⁶ The official site of the WWF-4 as follows: www.worldwaterforum4.org.mx

successfully implement these guidelines for the Future outlined by the 4th WWF without an adequate Training/Extension Services network.

The donors' support is indispensable for the development of a suitable **communication network** to supplement the regional **information system**. **This communication network must be** able to meet the needs of water managers and farmers to improve land/water use through use of Training/Extension Services' focal points (on a plug-in/plug-out basis). Bearing in mind the current high Internet costs that prevent widespread use of web-based training, one of the alternatives may be contemplation by IFI of installing some kind of a corporate IP telephony "Aral-net", exclusively connecting through Internet lines correspondents of the future Training/Extension Service Network. This will permit wider and rapid access to TC and SIC ICWC data base, ensuring information exchange at the province, irrigation system and WUA levels. Concurrently, the much wider use of CD-ROMs needs to be funded.

To ensure the successful implementation of integrated regional programs there is a need to establish Boards of Donors that could address coordination and interaction issues. This would permit better use of international donor funds, avoid unnecessary duplication of resources, and enhance co-operation between donors.

7.2.1. Developing synergy

The Future Training Network of SIC ICWC has the potential to consolidate a strong sense of awareness of the water management problems faced by the region. The future prospects for the region should be promoted in a manner that is based on sound knowledge and in communication with world water community and GWP family members. This will ensure a constant inflow of new knowledge, international experience and achievements into the training courses, and a broadened pool of skilled personnel in the region. (See Fig. 9)

Knowledge and skills are essential to improve water management in the process of transition to a market economy - the Aral Sea basin is no exception. To optimize the operation of regional Training Network, to promote regional self-help, and to sustain the existing regional research and infrastructure developed under the CIDA-sponsored Project, a cost-effective approach is needed alongside with donors' support. Currently there are a multitude of entities that participate in capacity building activities in the region simultaneously with TC ICWC. For example, agricultural, water-related, and nature-protection/environmental organizations (both national and international ones), offer short- and long-term courses, carry out case study research, provide on-the-job training scholarships in resource management, and hold short-term executive seminars for high level decision makers. One can see a lot of information in local and re-

gional mass media on such events, which often overlap and duplicate each other.

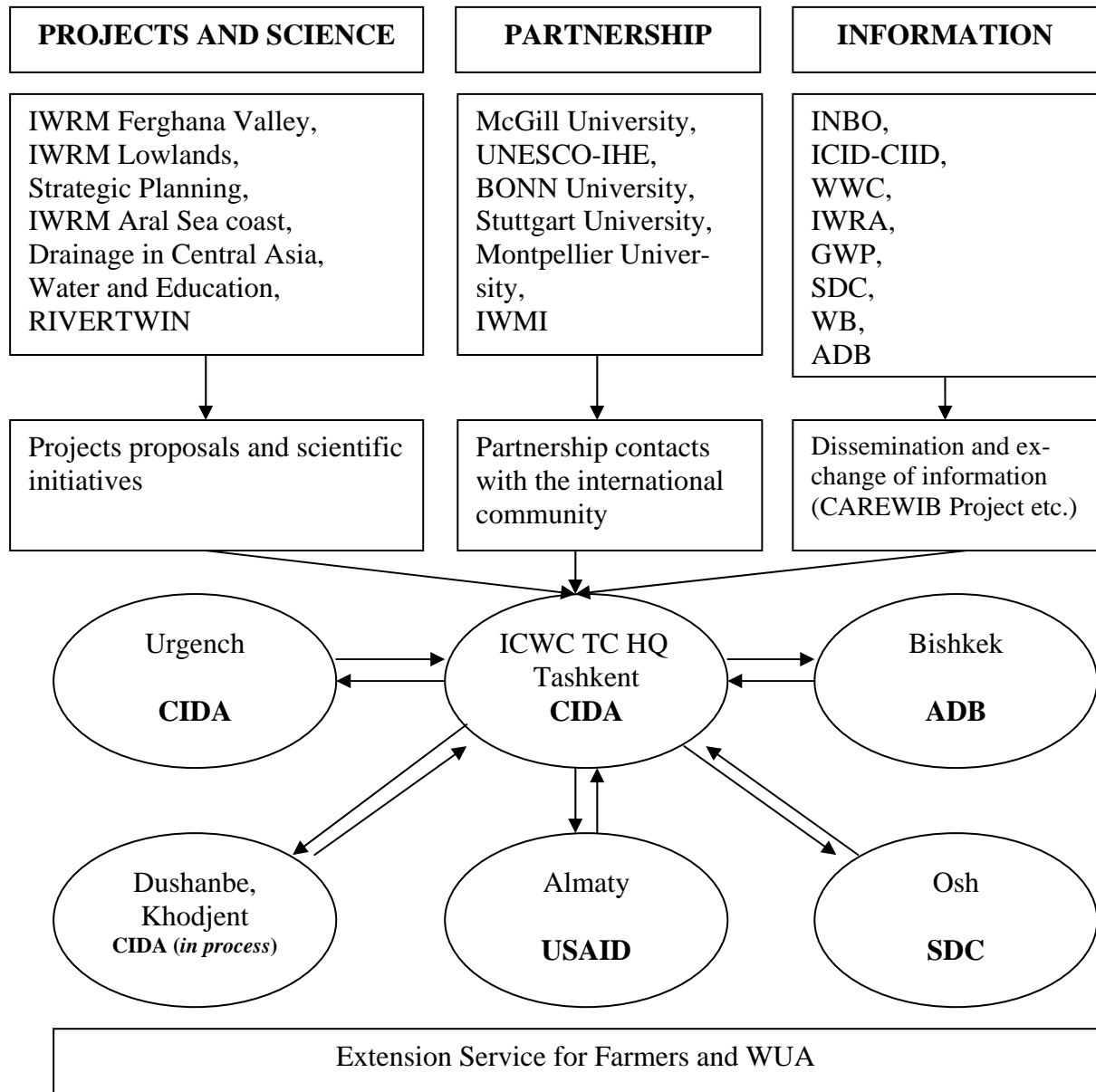


Fig. 9. Dissemination and exchange of information and knowledge both inside the Network and outside as well as the data and information flow

A combination and integration of efforts undertaken by all key institutions working in the field of irrigated agriculture throughout the Aral Sea basin is required. This support provided by the international donors' community should not be discrete and dispersed between projects - but concentrated around one core regional structure capable of organizing and "leading the orchestra" of versatile performers specializing in training, information exchange and other capacity building activities. A comprehen-

sive program of concerted efforts by all participants engaged in water-related capacity building activities in the Aral Sea basin is indispensable for shared water resources and environment management under the conditions of transition to a market based economy. **The SIC ICWC within the framework of a new *Future Training Network Program* - is fully capable to undertake this role as a regional platform for synergy between science, research, institutional capacity building and information exchange.**

* * *

It is important that the momentum gathered through the collective efforts of CIDA and ICWC is not lost. The CIDA Training Centre Project has made great strides for the promotion of IWRM principles and the establishment of a suitable framework for future works. Dissemination of information to grass-roots organizations has resulted in positive feed-back by farmers – especially with respect to the need for extension services. Failure to capitalize on these advances would most certainly have a widespread negative impact, and result in loss of confidence by the farmers who have strongly supported these initiatives.

In summary, it is imperative that the International Donor Community support the Training/Extension Service Network – this will provide far reaching results at policy, management, operational and grass roots levels.

SIC ICWC looks forward to working together with the Donor Community to create a Training/Extension Service Network that truly serves the interests of all the citizens of Central Asia.

8. ANNEXES

ANNEX 8.1. The list of training topics

No.	List of topics
1	Integrated Water Resources Management
2	Transboundary Water Resources: Strategies to Improve Regional Cooperation
3	International and National water law and policy
4	Integrated Water Resources Management in Fergana Valley
5	Remote sensing training
6	Advanced irrigation methods
7	Strategic planning and Sustainable management of water resources in Central Asia
8	Acquaintance with the project of a complex of the Aral Sea Basin Management models
9	Information technologies application under Integrated Water Resource Management
10	Dialogue on Water and Climate - case study of the Aral Sea Basin
11	Information system of IWRM-Fergana Project. Sections: "IWRM data base", "Modeling"
12	Integrated water resources management in Central Asia
13	International Water Law - Skills for Decision Making and Consensus Building
14	Principles of and Approaches to Accounting Adopted in International Practice
15	Drainage and Agriculture Problems in Arid Zones
16	Training course on Procurement
17	Capacity Building for regional strategy for irrigation and drainage in the Aral Sea Basin
18	Geographic information systems
19	Assessment of current tendencies in the ecosystem of the Aral sea basin
20	Integrated water resources management on district level
21	Prospects and abilities of introduction IWRM principles
22	Towards a strategy for sustainable irrigated agriculture with feasible investment in drainage
23	Strategic plan preparation for IWRM principles realization in Central Asia

No.	List of topics
24	Environmental protection issues in Central Asia Republic as related to water
25	Monitoring and provision of safety of huge hydrotechnical structures
26	Accounting principles. Theory and Practice
27	Preparation of draft "Curriculum on water education for the Secondary Schools of Uzbekistan"
28	Automation of the canal management in Ferghana Valley
29	Development of extension service in Ferghana Valley
30	Issues of integrated hydro-ecological water resources management of Chirchik and Ahangaran river basins and the modeling
31	Basics of Gender theory and gender analysis methodologies in water and agriculture
32	Establishing and functioning of WUAs
33	Realization of Integrated Water Resources Management (IWRM) principles
34	Public participation in sustainable water resources management
35	Public awareness for implementing of IWRM and the role of NGO and Youth Education

ANNEX 8.2. Matrixes for Monitoring and Evaluation

8.2.1. Questionnaire

ICWC Training Centre Regional Workshop/Conference

Nº	Questions	Yes	No	Comments/Proposals/Remarks
1.	Has the workshop come up to your expectations?			
2	Are you satisfied with the contents of given materials?			
3	Are you satisfied with the contents of lectures?			
4	Are you satisfied with trainers?			
5	Are you satisfied with the premises of the Training Centre?			
6	Are you satisfied with the equipment of the Training Centre?			
7	Are you satisfied with the agenda of training?			
8	Are you satisfied with the duration of the workshop?			
9	Are you satisfied with your accommodation during the workshop?			
10	Are you satisfied with meals during the workshop?			
11	Are you satisfied with the administrative personal of the Training Centre?			
12	Are the training/supporting materials you received sufficient?			
13	What topics would you recommend to include in the training program?			
14	What topics are not interesting for you and can be removed?			
15	What training is required for your organization and staff?			

16	Do you have any ideas on commercialization of the Training Centre activities? If you have them, we would be grateful to you for your suggestions.	
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8.2.2. Form of Curriculum Vitae

Initials: _____

Address (home): Republic _____

City _____

Street _____ Home _____

Tel. (code) _____

Address (work) City _____

Street _____ Home _____

Tel. (code) _____

Fax (code) _____

Date and place of birth:	
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Education:	
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Employment record:	
From _____ to date	

Hobby:	
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Language skills:	Level (excellent, good, poor)
	Mother tongue

8.2.3. Project Monitoring and Evaluation

Background

The Water Resources Management Training Project activities will be monitored through the use of a Results Based Management (RBM) approach. This approach emphasizes developmental results in all the stages of the project – starting with project development through each of the implementation phases. Monitoring is an essential component of this process – monitoring permits the project management team to modify its course of action (activities) in order to achieve the desired results. Participation is an essential part of RBM – this ensures that the program reflects the needs, priorities and vision of the project beneficiaries.

Project monitoring and evaluation will be completed throughout the life of this project; a comprehensive summary evaluation will also be completed on completion of all project activities. Different methods will be utilized in order to monitor project results, namely; questionnaires, interviews, correspondence and surveys.

CIDA is very interested to monitor the results of this project; in particular CIDA would like to know the strengths and weakness of the current training program and how it applies to your current work environment. Your feedback regarding the usefulness, relevance, and the on-the-job effectiveness of the current training program is therefore critical to the success of the project.

In order to achieve this objective, it is important that you respond to the following questions. Please provide as much feedback as possible; preferably ½ page minimum per question.

Your cooperation is very much appreciated.

1. Participant background information: (1/2 page)
 - Name, nationality
 - Occupation, responsibilities
 - Memberships, committees
 - Role in policy development
2. What are the strengths and weaknesses of the current ICWC training program? How could the present training program be improved? (1/2 page)
3. Have you received similar training before? If so please provide details - place, date , program description, etc. (1/2 page)

4. How relevant was the training – in particular how does it apply to your day-to-day work or that of your co-workers or associates. (1/2 page)
5. What aspect of the training was emphasized – for example instructional knowledge as apposed to technical knowledge? What aspect of the training was most useful? What other training aspects should be considered for future training? (1/2 page)
6. Has the training received helped in your understanding of the issues and / or resolving any of the problems? (1/2 page)
7. What would be the most effective method to implement the recommendations made at the conclusion of each workshop? (1/2 page)
8. Has the training has had any direct or indirect effect on policy development with in your sector of expertise? (1/2 page)
9. How could the communication network between the water sectors be improved?
10. Other comments or suggestions

ANNEX 8.3. Distribution of participants by country and by year

PERIOD:	MONTH	DAY	YEAR
FROM:	APRIL	1	2000
TO:	SEPTEMBER	30	2005

Countries	KZ	KG	TJ	TM	UZ	Other countries*	Total
2000	9	11	11	6	12	-	49
2001	63	45	55	27	99	7	296
2002	76	71	60	28	104	5	344
2003	41	89	64	30	159	1	384
2004	73	85	74	38	227	1	498
2005	49	90	76	39	192	9	455
Total	311	391	340	168	793	23	2026

ANNEX 8.4. ICWC Contribution in-kind

PERIOD:	MONTH	DAY	YEAR
FROM:	APRIL	1	2000
TO:	DECEMBER	31	2005

	Year 2000	Year 2001	Year 2002	Year 2003	Year 2004	Year 2005	TOTAL
Time Sheets	17380	24640	20560	15780	17270	16220	111850
Expenses	31171	43711	45047	51581	48773	46749	267032
TOTAL (USD)	48551	68351	65607	67361	66043	62969	378882

ANNEX 8.5. Donor's Contribution

Year 2001

Dates of conducting Workshop	Name of the Workshop	Donor Agency	Attracted funds (in USD)
22-31.03.01	Integrated water resources management	USAID (NRMP)	3598
19-26.04.01	Transboundary Water Resources: Strategies to Improve Regional Cooperation	USAID (NRMP)	5950
24-29.05.01	Transboundary Water Resources: Strategies to Improve Regional Cooperation	UNDP	2527
24-29.09.01	International and National water law and policy	USAID (NRMP)	4568
24-29.09.01	International and National water law and policy	DFID	11011
15-20.11.01	International and National water law and policy	DFID	6270
15-20.11.01	International and National water law and policy	USAID (NRMP)	2691
December 01	-	NATO	1128
Subtotal:			37743

Year 2002

January 02.	-	NATO	1100
January 02.	-	NATO	3600
21-26.01.02.	International and National water law and policy	DFID	10412
26-30.03.02.	Advanced Irrigation Methods	USAID (NRMP)	2785
08-13.04.02.	Advanced Irrigation Methods	USAID (NRMP)	4889
20-25.05.02	Transboundary Water Resources: Strategies to Improve Regional Cooperation	USAID (NRMP)	8900
14-18.11.02	Information technologies application under Integrated Water Resource Management	SDC	1208
04-07.12.02	Dialogue of water and climate – case study of the Aral Sea Basin	NATO	8700
24-26.12.02.	Integrated Water Resource Management - case study of implementing "IWRM in Ferghana Valley" Project	SDC	833
Subtotal:			42427

Dates of conducting Workshop	Name of the Workshop	Donor Agency	Attracted funds (in USD)
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Year 2003

08-11.01.03	Information system of IWRM-Ferghana Project Sections: "IWRM data base", "Modeling"	SDC	890
11-15.02.03.	Integrated water resources management in Central Asia	OSCE	4606
03-07.03.03	International and National water law – Skills for decision making and consensus building	USAID (NRMP)	3181
10-13.03.03.	International conference on "Strategy of sustainable development of irrigated farming with feasible investments in drainage: Aral Sea basin, Central Asia"	DFID	7000
21-25.04.03.	Drainage and Irrigated Agricultural problems in arid zones	USAID (START/AED)	2000
26-28.06.03.	Capacity building to the regional strategy for irrigation and drainage in Aral Sea Basin	DFID	10000
25-29.08.03	Geographic Information Systems	USAID (START/AED)	716
30.09.03-1.10.03	"Assessment of current tendencies in the ecosystem of the Aral sea basin"	NATO	2000
03-07.11.03	Integrated water resources management	USAID (START/AED)	5000
26-28.11.03	Development of the Strategic Planning for the Realization of the IWRM Principles in Central Asia	UNESCAP	4000
22-26.12.03	Integrated water resources management at the district level	USAID (START/AED)	11000
Subtotal			50393

Year 2004

15-16.01.04	Decision making support system and results of projects implemented in Aral	NATO	6000
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Dates of conducting Workshop	Name of the Workshop	Donor Agency	Attracted funds (in USD)
	Sea and Aral Sea coast.		
23-27.02.04	Integrated Water Resources Management in Transboundary Basins – an Interstate and Intersectoral Approach	NATO	40000
18-22.05.04	Environmental protection issues and tasks in Central Asia	USAID (START/AED)	10000
9-13.02.04	Advanced Irrigated Agriculture	USAID (START/AED)	11000
26-28.04.04	Development of the Strategic Planning for the Realization of the IWRM Principles in CA	UNESCAP	5000
18-22.05.04	Environmental protection issues in Central Asia Republic as related to water	USAID (START/AED)	11000
04-07.10.04	Improving of IWRM in Ferghana Valley. Results and prospect.	SDC	1895
Subtotal			84895

Year 2005

28-31.03.2005	Realization of IWRM principles	GWP CACENA	15000
04-06.05.2005	Realization of IWRM principles	GWP CACENA	15000
31.05-03.06.2005	Public participation in sustainable WRM	USAID/AED START	10000
05-08.09.2005	Public awareness for implementing of IWRM and the role of NGO and youth education	USAID/AED START	10000
28-30.11.2005	Principle organizational, legal and financial-economic measures during establishment and functioning of WUA	SDC	2500
Subtotal			52500
TOTAL (USD)			267,958

ANNEX 8.6. Regional Contracts

TC ICWC

tc@icwc-aral.uz

SIC ICWC

dukh@icwc-aral.uz

TC ICWC branch in Urgench

amubwo@rol.uz

TC ICWC branch in Osh

imwr@infotel.kg

GWP CACENA

vadim@icwc-aral.uz

**DEVELOPING HUMAN AND
INSTITUTIONAL CAPACITY
IN TRANSBOUNDARY WATER MANAGEMENT
THROUGH
WATER RESOURCES TRAINING NETWORK**

(Case Study in the Aral Sea basin, Central Asia)

Pre press Scientific-Information Center ICWC

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Republic of Uzbekistan

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