

# Capacity Building and Training are Key Tools for Implementing IWRM

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The capacity-building program complies with the fundamental provisions of the Regional Water Resources Management Strategy in the Aral Sea Basin [9] and IWRM. It encompasses the ICWC training system, along with strengthening the network of regional organizations and their subdivisions, establishment of regional and national information systems and communication facilities, SCADA, and developing the legal base for joint management of transboundary water resources.

Collection of information on modern world trends on development and improvement of the water sector practices and dissemination of this knowledge by conducting ‘get-to-know’ seminars, where the IWRM experience gained in countries such as Canada, France and Israel have preceded the popularization of IWRM in the region. The SANIIRI<sup>1</sup> experience, gained in the 1970s and 1980s by conducting regular scientific, practical and advanced training for water professionals from developing countries and providing technical assistance, within the framework program developed by the UN Economic Commissions for Africa, Asia and the Pacific, Latin America and Caribbean Basin etc., was very useful for this activities. At that time, the Regional Branch of All-Union Institute for Advanced Training of Water Professionals (for specialists from Central Asian countries, Kazakhstan and the Caucasus) was also established under the umbrella of the SANIIRI.

Reviewing the experience accumulated in our national water sector and comparing it with modern achievements of our foreign colleagues, one can state the fact that our science and practice undoubtedly were at sufficiently high level, although there were some shortcomings, for example, insufficient consideration of nature needs and the potentials of participatory approach in water resources management. Still, after the disintegration of the USSR and rupture of former links, with economic hardships faced in the course of transition towards the market economy, and lowered scientific and technical potential in the water sector in all Central Asian countries, the SANIIRI (already in the status of the SIC ICWC) continues the development of human resources. The young specialists familiar with modern methods of informatics, management, economy and legislation are being trained. At the same time, maintaining and developing relations with the International Commission on Irrigation and Drainage (ICID), UN Economic Commissions, UNESCO, FAO, CIDA, USAID, Mashav, NATO and other international agencies, the SIC ICWC has initiated the exchange of information and knowledge, including the organization of regional seminars in Tashkent and abroad.

This combination of the regional experience with international scientific and technical co-operation has promoted, to a considerable degree, the formation of the ICWC and development of the Aral Sea Basin Programs, GEF and Tasic projects. The Terms of References for these projects included the component of training and study tours for sectoral leaders to develop their own understanding of the needs of reforming the water resources management system along with the IWRM approach. Through these activities, public awareness on forthcoming water crisis, the necessary political support for the urgent necessity of introducing IWRM and transforming it into the state policy are being achieved.

The ICWC with its executive bodies (SIC ICWC, BWOs “Amu Darya” and “Syr Darya,” and the Secretariat) has developed relations with international water communities. As a result, in 1996, the World Bank supported development of “*The Basic Provisions for the Development of the Regional Water Management Strategy in the Aral Sea Basin*”. In this document, and for the first time, the need of implementing IWRM and as one of the key components of it, the ‘program of capacity building for joint transboundary water resources management and development’, has been developed and then approved at the governmental level.

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<sup>1</sup> SANIIRI is the research institute under the Ministry of Water Resources of the USSR that serviced the irrigation and drainage subsectors.

In parallel with above, due to realization of the needs in regular advanced training courses for water professionals, a decision was made at the 21st ICWC Session (24.10.1998) to establish Training Center with the financial support from the Canadian International Development Agency (CIDA). Thus, since 2000 the five-year project: “The Water Resources Management Training Project in the Aral Sea Basin” was launched in the partnership with the McGill University and Mount Royal College (Canada). The ICWC Training Center has started its activities by the kick-off seminar with the participation of senior officers of the ICWC and its executive bodies in compliance with the approved plan of advanced training courses for senior water professionals. The training policy aimed at achieving the awareness of IWRM backgrounds by the senior policy makers, leaders of governmental and non-governmental organizations and other stakeholders involved in implementing the pilot projects at each level of the water management hierarchy was specified in the course of this seminar. During the initial stage, senior officers of appropriate ministries and departments, then managers of regional and basin water management bodies, and finally specialists of water agencies were step-by-step involved into the training process.

The basic training strategy is the popularization of IWRM concepts and embedding them in the national action plans of reforming the national water sectors. Active participation of the leaders of national water sectors - ICWC members in the training courses has provided all-round support to social mobilization of water users and all stakeholders and the preparation of national IWRM action plans with the their follow-up approval by national governments. Such a training strategy was also aimed at raising the public awareness of the need in seeking inexpensive solutions and non-governmental funds for improving the water sector through developing new forms of institutions and public participation. All these actions have facilitated the advancement of IWRM and its recognition in national legal and normative documents.

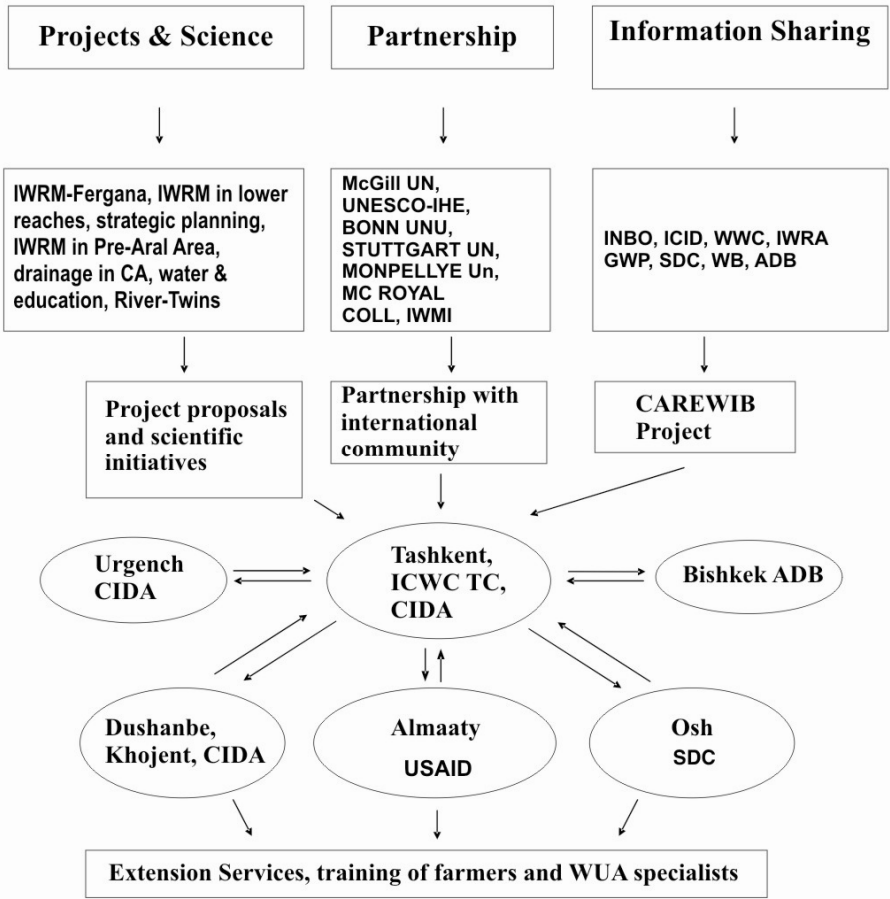


**Photo: Management of the SIC ICWC and ICWC Training Center together with the GWP Chair Mrs. Margaret Catly-Carlson**

A principle feature of these training activities were to ground the research findings of joint inter-state programs and various regional projects such as “IWRM-Fergana”, “IWRM Strategic Planning”, “Transition to IWRM in Lower Reaches of the Amu Darya and Syr Darya Rivers”, “Drainage Problems in Central Asia”, “Water & Education” “TWINBASIN”, “Central Asia Regional Water Information Base (CAREWIB)” etc. These research findings were used as case studies in lectures and presentations in the

training courses. Regular upgrading the presentations, diversifying the seminars' topics and improving training methods including the elements of situation modeling was also facilitated the co-operation with colleagues from the leading international universities and institutions, including the McGill University and Mount Royal College (Canada), IHE-UNESCO and ILRI (The Netherlands), Bonn University and Stuttgart University (Germany) etc. With the appointment of its Director, the regular information exchange between the membership of SIC ICWC and such international organizations as the ICID, WWC, INBO, IWRA, and GWP was established thanks to the support of such donor organizations as the CIDA, WB, SDC, ADB, USAID and as well as others who promotes solving these tasks. Mentioning the fact that establishment of the Regional Technical Advisory Committee of the GWP CACENA was also initiated by the director of the SIC ICWC and the kick-off seminar with participation of representatives of the GWP Secretariat was also held in the ICWC Training Center, is quite appropriate here.

Another feature of our training is the improvement of its efficiency due to decentralization through establishing the branches of the ICWC Training Center and covering greater number of water professionals. In Osh, for training specialists from the Fergana Valley's provinces within boundaries of Kyrgyzstan, Tajikistan and Uzbekistan (with the support from SDC); in Urgench for training specialists representing provinces in the Amu Darya Lower Reach within boundaries of Turkmenistan, Uzbekistan and Karakalpakstan (with the support from CIDA); in Alma-Ata (with USAID support ) and in Bishkek (with ADB support). It is also planned to establish the similar branches in Dushanbe (for training specialists representing South Tajikistan and Syrkhandarya and Kashkadarya provinces of Uzbekistan) and in Kyzyl-Orda (for training specialists representing South Kazakhstan and North Uzbekistan).



**Figure 5. 45 Dissemination of Water-Related Knowledge and Information**

Apart from the Osh Branch of ICWC Training Center, where seminars for training the specialists from Canal Administrations, provincial and district water management organizations and WUAs are held, the local training centers in Fergana, Andijan, and Khodjent were established in the frame of the IWRM-Fergana Project. In addition, the pilot training center on the basis of the pilot WUA “Akbarabad” was established in Kuva District of Fergana Province for training farmers and representatives of WUAs, community-based governments and village committees. Results of local training activities show that in order to improve the water use practice and water productivity the dissemination of positive experiences should be organized through the extension services. Therefore, further development of training activities requires the establishment of the special training points located directly on demonstration fields. In the framework of consultancy assistance, the trainers trained at higher levels of the training pyramid will be able to use these demo fields to train farmers to use up-to-date methods of water measurement and accounting, water applications and other technologies related to raising of water and land productivity.

*Interaction of the ICWC Training Center and its branches is organized in the following way:*

- Workshops for specialists of higher and middle levels and preparation of programs, workbooks and learning aids for the branches are conducted in the ICWC Training Center in Tashkent;
- Training of lower level’s personnel of water management organizations is conducted in ICWC Training Center’s branches by trainers who participated in preparation of programs of training courses and learning aids, using the network of project demonstration sites, database and the integrated information system of the ICWC Training Center.

Another important feature of activities of the Training Centre is the thematic seminars, involving representatives of related sectors. Topics of the training seminars are the followings:



## **Photo: Professor Ch. Madromoto (McGill University) Opens the Regular Seminar**

### **Session at the ICWC Training Center**

- integrated water resources management;
- co-operation in transboundary river basins;
- water legislation and policy; and
- improving irrigated farming.

The specialists from ministries and departments of nature protection, energy and representatives of NGOs along with the water professionals from Central Asian countries attended the first two seminars. The representatives of Ministries of Foreign Affairs and Ministries of Justice from each country, who are engaged in the preparation of inter-state agreements and national legislation in the field of water economy and nature protection were invited to attend at the seminars on water legislation and policy that were held with participation of experts from the Great Britain (the Dundee University) and Israel (the Israel Center of Negotiations and Arbitration).

The training system in the ICWC Training Center, envisages the organization of monthly 7-day seminars for training 20 to 30 persons, in the equal proportion representing five countries. , And in between these seminars, additional trainings are conducted in the branches. Those are held by lectures (specialists from local water management organizations who were specially trained by the lead trainers from the ICWC Main Training Center) for similar numbers of participants.

The accepted interactive form of training based on up front dissemination of the tutorials and additional training documents, and organizing dialogues and discussions on current problems and tasks faced by the water sector under the leadership of experienced moderators (often the ICWC members), facilitates fellow feeling, openness and trust. Essentially, each regional training seminar turns into a “round table” for representatives of different countries and economic sectors where the “brainstorming<sup>2</sup>” encouraged by moderators and an appropriate topic of lecture promotes reaching the consensus in the region at the cross-sectoral and inter-state level. At the same time, the minutes with collective recommendations are drawn up at the end of each seminar is sent to all ICWC members for further dissemination and taking the measures for upgrading and improving the existing systems.

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<sup>2</sup> intensive discussion to solve problems or generate ideas



**Photo: Participants of the Seminar Held at the ICWC Training Center**

Establishment of an enabling environment for friendly contacts between specialists from different countries and economic sectors engaged in solving water problems during joint exercises and leisure-time is an additional achievement of such regional trainings. This is especially important because today's participants of training courses are young people who in the nearest future can be leaders of local or republican authorities, large production associations and even economic sectors i.e. the policy makers.

Up to now, more than 2690 specialists have learnt such topics as IWRM principles and experience, water legislation, best irrigated farming practice, participatory approach, gender aspects of IWRM and others in the ICWC Training Center.

**Table 5.45 Training of Water Professionals: Number and Distribution over Countries**

Country / Year	Kazakhstan	Kyrgyzstan	Tajikistan	Turkmenistan	Uzbekistan	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
2006	70	85	84	28	386	15	668
<b>Total</b>	<b>381</b>	<b>476</b>	<b>424</b>	<b>196</b>	<b>1179</b>	<b>38</b>	<b>2694</b>

The ICWC training Center has established the special database with current information on each former participant of training courses to support feedback with them. This database is annually updated, taking into account all changes in their professional status and some of them are invited for jobs in our branches. Thus, specialists who were trained in the ICWC Training Center in Tashkent can train the lower level personnel of water management organizations, WUA and farmers using the program modules, methodological manuals and visual aids developed in the ICWC Training Center. At that, the efficient multi-step system, under which each trainee hands over his knowledge to his peers and lower levels (the domino principle), is established.

Information on the ICWC Training Center's activities and also its recent and planned seminars is available on the website. For qualitative evaluating efficiency of these seminars', let us review, for example, the advanced course on integrated water resources management attended by the overwhelming majority of trainees representing water professionals of top and middle levels of the water management hierarchy as well as water users and their associations. Raising their awareness on the significance and necessity of the water sector reforms through introduction of advanced principles of water resources management, prepared the enabling environment not only for implementing the IWRM-Fergana Project but also for the project of water resources management in the transboundary Chu-Talas basin, based on the participatory approach taking into account the interests of all stakeholders.

All these activities, in turn, have resulted, on the one hand, in widening the circle of like-minded persons and disseminating IWRM ideas as the single way for our planet to survive in the future and, on the other hand, in strengthening the partnership of water professionals for solving water problems. At present, the opportunities for introducing IWRM in the river lower reaches of the Amu Darya and Syr Darya, as well as in the Zerafshan River Basin are being reviewed according to the same principles.

Raising the awareness level in respect of IWRM and involving water management organizations' personnel and water users in appropriate pilot projects have been promoted step-by-step. This has resulted in inclusion of these ideas into important legal documents, such as Water Codes of Kazakhstan, Kyrgyzstan and Tajikistan, the Law "On Water Users Associations" (Kazakhstan), the Decree signed by the President of the Republic of Uzbekistan "On Major Directions of Reforming the Agricultural Sector" and the Resolution of the Cabinet of Ministers "On Improving Governance of the Water Sector" (Uzbekistan).

Similar positive results were achieved in the cooperation related to joint management of transboundary water resources and developing water legislation and policy due to the advanced seminars with participation all stakeholders involved in activities of cross-sectoral conciliation commissions engaged in the preparation of inter-state agreements. The experience of seminars and their collective minutes undoubtedly confirm that countries located in the Aral Sea basin can successfully and efficiently solve the problems of water availability for irrigation and hydropower generation only based on effective mutually beneficial collaboration. Such co-operation should base on the principles of hydro-solidarity, mutual respect, consideration of all stakeholders' interests, minimizing harm for the irrigation practice, hydropower generation, and the environment and using the existing potential under transition towards the market economy.

It is obvious that before, the separatist tendencies that impeded activities related to realization of agreements on information exchange and strengthening the regional executive agencies that were earlier signed by the ICWC members have dominated in inter-state water relations. Now, understanding of the need in consolidation based on the collaboration and readiness to revive activities of conciliation

commissions is rising due to widening the circle of like-minded persons in appropriate ministries and institutions in each riparian country.

There are similar positive shifts related to the advanced courses on improving the irrigated farming practices. Those are creating the awareness that under water resources scarcity, the only solution to mitigate contradictions between supply and demand of water is demand management, based on the introduction of water-saving technologies. As a result, the awareness of opportunities for achieving potential water productivity, enable to increase agricultural output twice with reduced water consumption by 10%, is rising. This, in turn, stimulated the governments to allocate investments for establishing the network of demonstration sites that play a role of the extension services for farmers, WUAs and water management organizations and demonstration of latest methods of water conservation. In the course of the advanced training on water-saving technologies and raising water and land productivity, the need of involving women in solving these socially-significant tasks and developing the special program “Water, Gender Aspects and Agriculture Production Improvement” was revealed.

Series of seminars, with invited representatives of NGOs and mass media, was conducted to raise the public awareness. Trainees of these advanced courses, studied the current problems of the water sector and nature protection, including the peculiarities of reforming and democratization of the governance of water sector. Popularization of the importance of participatory approaches under the introduction of IWRM and water conservation practices is the only way of survival under the growing water resources scarcity is the important message conveyed through these training activities.

A series of seminars under the framework of ‘Water & Education Project’ that is supported by the OSCE and the Ministry of Education of the Republic of Uzbekistan was conducted to form the vision of the future generation of water consumers that should be oriented on care of water resources. IWRM basics are explained to school teachers at these seminars, in order to facilitate the integration of IWRM principles into school curricula.

The regularity is a key factor in the establishment of an efficient training system. It is important not only due to permanent personnel turnover at all levels of water management hierarchy but also due to update of knowledge and methods tested at pilot systems that should be disseminated among water users. Advanced courses on IWRM, therefore, for Heads of departments and divisions of the MAWR (committees, departments, central administration) should be held on a regular basis (no less than twice a year: prior to and after the growing season) in Tashkent, Urgench, Alma-Ata and Bishkek. In addition, the similar advanced courses need to be organized for chiefs of provincial water authorities and BISA, their deputies and heads of water use departments, representatives of local governments and WUAs’ specialists no less than twice a year in each province of Central Asian countries. These advanced courses should cover the following topics:

- institutional and legal aspects of improving the system of establishing WUAs, Canal Water Users Unions, and Water Users Groups;
- improvement of the water measurement and accounting systems at the level of WUA, WUG and CWUC; and
- Rehabilitation of irrigation and drainage systems and ameliorative measures on the fields.

Advanced courses for water professionals and capacity-building efforts in the water sector need to be developed along with upgrading the information system, introduction of the SCADA and creating the legal base for joint management of transboundary water resources. This was initiated in 1996, when the regional



information system “WARMIS” and the database<sup>3</sup> on land and water resources with GIS component were established in the frame of the WARMAP Project<sup>4</sup> (the EU Tacis Program). This system is regularly updated and improved, with filling information along the following blocks: economy, surface water resources, groundwater, land resources, climatic data, industry, administrative-territorial system, the ecological aspects of the Aral Sea and Pre-Aral area. At present, this activities is in progress with financial support from the SDC in the framework of the project “Central Asian Regional Water & Environment Information Base (CAREWIB)”. The project has created a web-portal for water and environmental issues in Central Asia (“CA Water-Info”) and the regional information system including the knowledge database. This database with a GIS component, information block of Hydro-Meteorological Services with data on river flow rates, BWO block with data on sharing water resources in river basins, and analytic block with a set of modules and models for assessing current water availability and forecasting annual and mean annual water availability. The project is aimed at capacity building of water management organizations through their involvement in the relevant network operations. They are actively interacting at the regional, basin and national levels through establishment of national information systems linked to regional, basin and national databases. At the same time, in order to maintain the sustainable operation of the CAREWIB, the advanced courses are conducted for the specialists, who services the national information systems. They flow through the introductory course on the unified methodological base of building-up the information system. At the end receive the software and existing data on their countries and provinces, as well as the follow-up transfer of data for the purpose of supporting and developing the national databases. In return, provide regular information exchange and filling the regional database with appropriate data. Coordinated actions of specialists at all levels of the water management hierarchy and free access to information for all stakeholders will undoubtedly facilitate capacity building of the water sector and successful introduction of IWRM in the region.

The establishment of systems of control and data acquisition (SCADA) at water intakes of inter-state importance, was initiated on waterworks serviced by BWO “Syr Darya” with the financial support of the USAID, and now is implemented on pilot main canals of the IWRM-Fergana project and funded by the SDC. This system equipped with electronic means of accessing, storing, and transferring information allows preventing not only uncontrolled water diversions from the river but also raising the accuracy of water supply (up to 2% instead of 10% in the past) and reduces unproductive water losses. In addition, the integrated complex of automated transmission of technological information ensures free access to information by all stakeholders. The daily updated actual data on flow rates and water levels at all waterworks serves as a confidence-building measure in the process of joint water resources management. The special training seminars are held in the ICWC Training Center, its branches and directly at waterworks equipped with the SCADA systems for specialists responsible for operation of these systems to improve their professional skills. The introduction of SCADA system on waterworks serviced by BWO “Amu Darya” is planned in the nearest future with the support of ADB.

Developing the legal base for joint management of transboundary water resources was also initiated under the framework of the WARMAP project that enabled the preparation of drafts of four agreements regulating the institutional set-up, information exchange, water use and nature protection. Authorized national working groups consisting of representatives from different economic sectors were established and they work on continuing basis provides the continuity to this activities of improving legal base of regional cooperation. In parallel, activities on improving the national water legislations, by means of including the provisions that regulate the introduction of IWRM as a key tool to raise water productivity at all levels of water use was initiated. At present, this activities is supported by the ADB and implemented through the project: «Improvement of Shared Water Resources Management in Central Asia» (ADB RETA 6163) that is aimed at developing the program of legal and institutional measures for capacity building of inter-state water co-operation in the Aral Sea basin. As a result of this activities the drafts of agreements were developed and then discussed at regional workshops, covering the following aspects: i) information

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<sup>3</sup> The WARMIS Database is a relational database, consisting of tables with text data. The database contains information on water and land resources and their use, climate, economic indicators, and water quality.

<sup>4</sup> Water Resources Management and Agricultural Production Project

exchange; ii) strengthening the ICWC status; iii) joint use of water and hydropower resources of the Syr Darya River; and some separate regulations and rules of river basins management.

Inclusion of the findings of all abovementioned projects into workbooks of the ICWC Training Center creates the closed cycle of continuous self-improving the established training system and the continuity of capacity building process.

In the process of capacity building it is necessary to extend the subject area and to involve specialists from related economic sectors such as hydropower generation, drinking water supply, nature protection, hydro-meteorological services into activities related to improving water governance and ensuring rational use of water resources. At the same time, it is necessary to organize the special seminars aimed at preparing the base for public participation in IWRM and establishment of network of NGOs interacting with the water authorities in each Central Asian countries. There is a need to conduct training courses on management of water and environment projects, including such aspects as preparing for economic reforms, improving agricultural production, developing fishery in irrigation systems. In addition, the scope of activities should be extended to works related to the training programs of international development agencies and financing institutions.

Thus, the established system for capacity building of the water sector assists water professionals to study the world experience, to project the path “from the vision towards the action”, to screen priorities, to reach the new quality levels using the state-of-the-art systems of computerization and informatics, as well as internet resources. Along with raising the level of professional knowledge and acquaintance with state-of-the-art technology in the field of water and land resources management, irrigation and drainage and environmental protection, the established system of training facilitates, the strengthening of cooperation between riparian countries and development of the common approaches at the level of technical experts and policy makers. Hence, the ICWC Training Center, being the champion of state-of-the-art technology in the field of water and land resources management, also becomes the platform for strengthening the regional cooperation in practical implementing IWRM at the level of irrigation systems and river basins in coordination with national priorities, balancing national needs with regional limitations.