

Interstate Coordination Water Commission of Central Asia	<b>BULLETIN № 2 (37)</b>	May 2004
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## **38-th MEETING OF INTERSTATE WATER COORDINATION COMMISSION**

Regular 38-th CWC meeting was held on March 4-6, 2004 in Ashgabat under chairmanship of Minister of Water Resources of Turkmenistan B.O.Kalandarov

Meeting agenda was as follow:

1. water intake limits realization during non-growing period 2003-2004 and limits approval for next growing season 2004 as well as coordination of reservoir cascades operation regime (responsible: BWO "Syrdarya" and "Amudarya").
2. Project «IWRM-Ferghana» progress (responsible: SIC ICWC).
3. ICWC executive bodies activity during period of 2000-2003 and measures on its improvement (responsible: BWO "Syrdarya" and "Amudarya", CMC ICWC, Training Center).
4. Preparation to annual scientific-applied conference in Almaty.
5. Agenda of next 39-th ICWC meeting.

Additional question – water related situation in Syrdarya middle and lower reaches during autumn-winter period 2003-2004 and measures on its stabilization.

ICWC members accepted BWO "Syrdarya" and "Amudarya" information about water intake limits realization and reservoir cascade operation during non-growing period 2003-2004. Water intakes limits were approved and reservoir cascade operation regime was recommended for growing season 2004. Responsible: BWO "Syrdarya" and "Amudarya" are charged to take measures on water intake observance in accordance with established limits.

Participants endorsed «IWRM-Ferghana» project activity during 2002-2003 carried out by MAWR of Kyrgyz Republic, MWR of Tajikistan, and MAWR of Uzbekistan. Necessity to strengthen activity was noted:

- to develop clear rules of water intake limits establishing and correction to achieve water saving and water supply evenness;
- Water Committees of Canal and WUA;
- pilot experiments and field demonstration dissemination over wider area.

ICWC members will help IWRM principle introduction and «IWRM-Ferghana» experience in the countries of the region.

BWO "Syrdarya" and "Amudarya", SIC ICWC, CMC ICWC and Secretariat about activity during period of 2000-2003. It is recommended to take measures on improvement of cooperation between countries especially regarding common legal base creation.

ICWC members will help executive bodies:

- in technical base strengthening;
- in reconstruction of out-of-date structures;
- in automatic management systems introduction;
- in hydrometeorologic and forecast services improvement;
- in procedure of border crossing, custom control and status.

Taking into account importance of personnel training, ICWC members decided to give

Training Center statute of independent organization – ICWC executive body entrusting SIC ICWC to legalize it.

SIC ICWC is charged to submit on behalf of ICWC and EC IFAS draft Agreement on establishing information database of regional organizations for EC IFAS approval.

Participants decided to appeal to ECIFAS to include CMC ICWC in list of IFAS organizations with status of international organization. Participants endorsed Organizing Committee's working group activity on preparation to Almaty conference "Water partnership in Central Asia".

ICWC member A.Ryabtsev's information about water related situation in Syrdarya middle and lower reaches and measures on its stabilization.

In this connection BWO "Syrdarya" is charged:

pay attention to Naryn-Syrdarya reservoir cascade operation in March-April; jointly with Kazakhstan and Uzbekistan representatives to establish working group for proposals preparation on Chardara and Arnasai reservoirs joint operation regime for non-growing period of 2004-2005 with regard to land and settlements flooding.

Decision is made to carry out next ICWC meeting in Almaty on May 26-28, 2004.

## **PROTOCOL DECISION ON FIRST ADDITIONAL QUESTION ON AGENDA OF EXTRAORDINARY ICWC MEETING**

April 20, 2004

Tashkent city

To agree with proposal of ICWC member A.Jalalov, taking into account services in ICWC establishing, SIC ICWC contribution in ICWC functioning, on election of Dukhovny V.A. Honorable ICWC member decorating him by special breast.

For Republic of Kazakhstan  
 For Kyrgyz Republic  
 For Republic of Tajikistan  
 For Turkmenistan  
 For Republic of Uzbekistan

Ryabtsev A.D.  
 Bekbolotov Zh.B.  
 Nazirov A.A.  
 Altiev T.A.  
 Jalalov A.A.

## **INTERNATIONAL FUND FOR ARAL SEA SAVING MEETING**

### **REGULAR IFAS BOARD MEETING IN DUSHANBE ON MARCH 2004**

Board members, plenipotentiary members from countries-founders, EC IFAS members, minister and agencies' leaders from Tajikistan, representatives of international organizations and mass-media took part in the meeting.

Following questions were considered:

EC IFAS activity in 2003 and heads of State decision dated October 6, 2002 fulfillment.

Working conference «Priaralie social-ecologic issues solution».

Approval of IFAS Board meeting schedule since March 2004 till February 2005.

International conference devoted to 10-year actions «Water for life» on March 22-23, 2005 in Dushanbe.

Approval of provision on Regional IFAS Hydrologic Center (RHC IFAS).

Coordination Metrological Centre (CMC ICWC) inclusion in list of IFAS organizations determined by «Agreement between riparian countries on IFAS and its organizations status» dated April 9, 1999.

Board meeting was chaired by Deputy Prime Minister of Tajikistan, IFAS Board member K.Kaimdodov.

IFAS Chairman, First Deputy Minister of Foreign Affairs S.Aslov reported about EC IFAS activity in 2003.

Board members considered all above questions and made appropriate decisions.

Meeting proceedings have been submitted governments of countries-founders for their realization.

(acc. to EC IFAS website [www.ec-ifas.org](http://www.ec-ifas.org))

### **SECOND DONORS' MEETING ON WATER ISSUES**

Second donors' meeting on water issues was held in Tashkent on February 6, 2004 in ADB resident mission. Meeting was devoted to realization of improved mechanism on information exchange and coordination between donors.

ADB mission in Uzbekistan S O'Sullivan's speech was dedicated to water ADP programs and projects presentation.

Representatives of bilateral and multilateral donor organizations and executive organizations took part in the meeting. Participants recognized importance of donors meeting and approved its format (alternating places of meeting, participation of donor and executive organizations). Goal of meeting is support of interaction mechanism and

It was decided that information exchange mechanism should be improved including on-

going programs and projects, role of regional organizations, water-power relations, etc. SDC mandate on next meeting conducting has been approved.

### **Discussions on projects**

ADB representative described progress in water and agricultural programs. ADB is involved in on-farm water management and water policy improvement at all levels that will provide sustainable water supply and equal participation of beneficiaries. At local level farmers should be given freedom of choice and income increase.

Recently two loans were given to Uzbekistan.

First – project of grain production improvement (26mln.USD) with component of irrigated lands effective use. Second – Amu Zang water resources management project (73mln.USD) directed to Amu Zang irrigation system reliability, efficiency and sustainability improvement (100th.ha) and agricultural reforms acceleration. At regional level, ADB allotted 0,8mln.USD for own strategy of assistance to the region development

JICA representative presented results of study «Improvement of tariff policy and management in water supply sector» carried out in 1999-2000 on request of Uzbek Government. In 2003 general plan of Tashkent water supply improvement was presented for the period up to 2015.

SIC ICWC representative presented detailed report on ongoing projects. Project of regional database for water sector of Central Asia (CAREWIB) is directed to creation of the regional water-ecologic information portal providing user's friendly on-line access to information about water management and associated issues.

Report on project «IWRM-Ferghana» funded by SDC was presented where it was found that agricultural lands in upper reaches suffer from abundant water and because of that water productivity increase can be planned through simple initiatives.

In conclusion, SIC ICWC representative told in detail about ICWC Training Center activity and underlined importance of regional cooperation questions inclusion in training topics.

NRMP project representative presented multipurpose USAID funded program. Program was launched in September 2000 and will last to August 2005. Program strategic approach includes target short-term and medium-term measures (1-3 years) on organizational reforms through demonstration models, bilateral strategies and partnership.

Program works due to combination of loans and grants.

Representative insisted on importance of analyses, field trips and research cost and time minimization. Some questions relate to infrastructure rehabilitation, water-power trade-off, reservoir operation, water and power infrastructure integration, training and propaganda including on-farm water management using demonstration models.

After presentation participants discussed framework Agreement-1998 on Syrdarya basin extension under difference between WB and USAID opinions. NRMP project facilitates technical modernization (pricing concept, bilateral sub-contract, DSS system establishing, regulation system) and agreement extension for next 5 years.

US State Department (USSD) and USAID office in Tashkent and Almaty representative

informed about program of WUA support (WUASP). Project budget is 25mln.USD will be distributed for 5 years among three states within Ferghana valley. It includes training, technical assistance and grants. Project implementation unit must start its work since June 1, 2004.

He also presented new initiative- project of integrated water resources management in Amudarya and Syrdarya lower reaches, which starts now. Project will be directed at transboundary collaboration development in IWRM introduction between three countries: Kazakhstan, Uzbekistan and probably Turkmenistan.

World Bank representative presented report on ongoing projects funded by the bank. For Syrdarya basin WB recently has developed new approach to sustainable regional cooperation in water and power sector. Short-term measures include reforms in sectors and set of technical and economic measures. Medium-term strategy is directed at development of new management method accompanied by reconstruction of irrigation and power systems to reduce losses and to increase downstream countries potential of water accumulation for irrigation during growing season.

It will allow manage Naryn cascade regime during winter. With this purpose component C of WEMP project (Reservoir management and dam safety) was transformed into two projects: Arnasai dam construction this year and Chardara dam rehabilitation (40-50mln.USD). Similar strategy can be applied to Kairakkum reservoir in Tajikistan.

Expected results are as follows: (i) increasing water management flexibility in Syrdarya basin, (ii) accumulation and regulation of winter flow for sanitary and ecologic releases to Syrdarya delta, (iii) possibility to double crop yield in tail part of the basin. Options of long-term strategy will include cost for new power projects (Kambarata I and II), which will help to increase energy generation in winter without winter releases.

On February 5, 2004 Uzbek project has been signed for irrigation, drainage and wetland improvement (DIWIP) in Karakalpakstan (75mln.USD; 100th.ha) has been signed. Project will be completed in 2005. WB representative expressed WB interest in cooperation with IWMI and ICARDA in land leveling, WUA establishing, yield increase and salinization combat.

Brief presentation of farmer ownership model (FOM) in Khodjent, Tajikistan funded by Seco and IFC was made by project team leader. Project goal is to provide farmers' access to agricultural outputs, marketing services, technical assistance and training on base of competition through private company SugdAgroServ (SAS).

ICARDA representative informed about start of second phase of ADB project «Rural population living standard improvement through effective on-farm water and soil fertility management in Central Asia». Main goal of this project is organization of large scale demonstration of new technologies on farmers' fields in interconnection with other development projects implemented by governmental organizations and NGOs. One of the major on-farm measures is water use efficiency increase.

Discussion about effective and sustainable WUA establishing was follow-up of discussion at the first donors' meeting on water issues. Participants discussed also regional issues of water-power resources management in Syrdarya basin (with regard to NRMP and WB approach to water0power relations).

Third meeting will be organized by USAID in Tashkent in the beginning of May 2004.

## WEEK OF ASIAN DEVELOPMENT BANK

“Week of Asian Development Bank” was carried out in Manila (Philippine) on January 26-30, 2004 united with regional meeting of Third World Water Forum in Asia. There were 350 participants from Asia and Pacific Region.

Regional meeting held on January 26 and organized by Secretariat of WWF-3 elected two topics for detailed discussion: “Integrated water resources management and “Water and Climate”.

At plenary meeting WWF-3 General Secretary K.Oda, WWC President V.Cosgrow, and GWP representative A.Hall made presentations.

At session «Integrated Water Resources Management: regional actions and partnership» under chairmanship of Alan Hall 5 key reports were presented.:

«Past experience and IWRM in the Aral sea basin». Prof. Dulkovny V.A., SIC  
ICWC (presented by D.Ziganshina).

«Start of NARBO project: Network of basin organizations in Asia». W. L. Arriens, ADB.

«IWRM actions in South Asia». L. Dassenaike, GWP Advisory Center at IWMI.

«Alliance water and gender activity». Ms. Maria Arce, GWA

Program WASH Manila. Dr. Ramos.

Presentation Cap-net South Asia. Dr. Jasveen Jairath.

Mr.Arriens told about main directions of ADB activity after WWF-3. He presented also joint project of ADB, ADB Institute and Japanese Agency of Water Resources on establishing network “Network of Asian River Basin Organization, NARBO”. Main goal of this network is basin organizations’ potential and efficiency increase through IWRM promotion and information exchange.

“Water and Gender Alliance” (GWA) Executive Secretary Mrs.Arse was devoted to Alliance and ADB joint activity. It was noted, that women are vulnerable group and their participation in water resources management is very important for poverty eradication.

WASH Manila project Director beside report about main project objectives, demonstrated video “WASH caravan”. It is caravan of cars with cartoon film heroes who demonstrate to different communities basic rules of sanitary and hygiene. Main goal of the project is to change thinking and behavior relating to water value. Within the project brochure has been issued with children’s comics regarding water.

One of the main WWF-3 objectives is definition of the most important themes for the region, which should be presented at global level. Transboundary water resources, public participation, NGO role, ethics issues, partnership and funding are key problems. present key issue.



## **ADB water week**

First «ADB water week» was carried out in December 2002 under slogan «Water for all – ADB water policy implementation». Second week slogan was «Water for poor – creation of rules and fund rising». Water week showed importance of water governance and how it can be transformed in the better rules and procedures beneficial for poor. Second direction was proper control of water resources and supply funding. All efforts were considered within framework of MDG, in particular, reduce twice number of people with access to safe water and sanitary by 2025. Common slogan was «poverty eradication should be driven force of all future actions».

J.Camdessus' report was devoted to actions on expert group recommendations application. J.Camdessus called to double financial flows to reach MDG attracting both own and external funds, noted close link between funding and management and necessity to mobilize all means to achieve progress. ADB take active part in recommendations preparation, supported group of experts and is applying these provisions on its water policy. ADB prepared own commentaries to report of expert group noting insufficient attention to rural water supply financing, wastewater management. Special UN representative in Asia and Pacific Erna Witoelar called for “. Mrs.Witoelar underlined lack of political support.

Successful examples of water management were presented. This year water supply department of Pnompenh (Kambodia) was awarded by ADB Water Prize. Department extended services from 40 to 80% since 1993 reaching 99% of cost revenue.

In his report “Is there plot against poor?” Charles Andrews, ADB Principal Water Supply and Sanitation Specialist paid attention to interconnection between poor management and position of poor. Situation can be improved by self-governance introduction, effective leadership and public involvement.

Possibility of poor water right change considered in report “Weather poor suffer because lack of water right?” by Bryan Bruns, Consulting Sociologist. Positive results can be achieved through basic needs provision, participation in management, preventing and resolution of conflicts, investment for poor. In report “Are low prices for irrigation services difficult for poor?” by Intizar Hussain, Senior Economist, International Water Management Institute is underlined that irrigation water and services can't be free of charge.

Results of “water week” second day can be summarize as follow:

Pay attention to link between poverty, water and gender

Maximize water role for MDG achieving

Scenario «Business as usual» does not act anymore

Pay attention to large funds and prepare target programs in combination with reforms

Poor can and are ready to pay

Subsidize poor

Water right will help to reduce poverty but what right is needed?

Main factors for poverty eradication under water resources management are rights, investments, institutions, governance and services

Is evident that only water management is unsatisfactory but what else is necessary?

- Partnership will play decisive role in changes initiation and support.

Necessity of cooperation and partnership with international financing organizations, private sector, NGOs and other concerned parties was underlined. Besides, all participants agreed to provide priority of poverty eradication in development programs.

ADP Vice president Geert van der Linden in his report underlined that DB should creatively consider link between investments and their application. He mentioned importance of leadership (governance) in water resources management.

On the third day answers on questions put in three previous reports were obtained. In particular, necessity was recognized:

- efforts in development should positively influence poverty reduction;
- right balance between long-term efforts and urgent needs provision;
- improvement of poor access to financing from both external and internal sources;
- maximizing use of existing knowledge and information network;
- promoting gender leadership.

In his conclusive speech ADB Vice President Liqun Jin called for better governance (leadership) and partnership. “More perfect governance is needed for effective policy, self-governance and water supply under strengthening regulation mechanisms and civil society mobilization for reforms”.

“Partnership in water sector should be built on interaction of all concerned parties for achieving appropriate outcomes”, - Mr.Jin mentioned.

## **ANNUAL MEETING OF SWISS-SOURCE “SUSTAINABLE WATERSHED MANAGEMENT” PROGRAM’S COUNCIL OF PATRONS**

Council of Patrons meeting was held in Rütli, Switzerland on April 5-6, 2004.

Council Chairman Peter Forstmaier, Swiss Minister of Foreign Affairs Micheline Colmeiro with report “Swiss government policy in international sustainable development”, SDC representative and international organizations: “GEXSI” – global exchange on social development – Dr.Marita K. Biberman Kosh-Veser, Albrecht von Handberg; International Red Cross – Doris Parister, “WWF” – International Wildlife Fund – Director Dr. Klaudia Martin, «International Two-centuries Association» - Director Rolf Letterib.

Council summed up outcomes of previous activity for 2003, awarded grants for best works and planned grants program for 2004.

First place and grant in amount of 75000USD was awarded to Vietnam project “Watershed sustainable development in community Ka Tu in Central Vietnam” presented by WWF Indo China and Forestry Department of Chuang Nam province.

Second place and grant in amount of 25000USD was awarded to project “Vetiver plants utilization for sustainable protection of slopes subject to erosion in Dabi mountains, China”.

Both projects are directed to population well-being improvement, watershed public management within flow formation zone and combat for sustainable environment.

Promotional bonus (George Ficher Fund) was awarded to Tanzania project “Water sources management on Kilimanjaro mountain and their sustainable maintenance for municipal needs”.

At joint meeting of patrons and jury members headed by Thomas Streif of Central Asia, Russia, Caucasus and Eastern Europe low participation was considered.

In competition of 2002 from this region 22 proposals were presented and only two from them were selected for nomination, in 2003 – 8 and none were presented and nominated respectfully.

Reasons for that are following:

- most proposals were theoretical (research, modeling) and had no practical application;
- all proposals related to water management but not to watershed management concerning ecologic and social orientation;
- outputs and importance were not expressed clearly;
- public participation, role of communities, local authorities were not underlined;
- very poor English – sometimes even project idea is unclear.

Prof.V.Dukhovny as patron responsible for the region, promised to familiarize all participants with these comments.

## **INTERNATIONAL CONFERENCE «STRATEGY OF IRRIGATED FARMING SUSTAINABLE DEVELOPEMENT WITH FEASIBLE INVESTMENTS IN DRAINAGE: ARAL SEA BASIN»**

International Conference “Strategy of irrigated farming sustainable development with feasible investments in drainage” was held on March 10-13, 2004 in ICWC Training Center.

Conference organizers: MAWR of Uzbekistan, SIC ICWC, IPTRID/FAO, HR Wallingford (Great Britain), McGill University (Canada); sponsors: European Commission (INCO), WB and CIDA.

Participants were presented by experts, leaders and lead specialists of water related agencies of Central Asia, representatives of international organizations: SIC ICWC, IPTRID/FAO, WB, ADB, SDC, USAID, CIDA, HR Wallingford, Alterra-ILRI, Water-Watch, Brace Center, Van’s consulting), USA, Great Britain embassies and mass-media.

Moderators: Prof.V.Dukhovny (SIC ICWC Director), Dr.H.Denecke (“Water and Sustainability” regional manager, IPTRID/FAO, Italy; Dr.Sawfat Abdel-Dayem (WB expert in drainage, USA), Prof.Chandra Madramootoo (Director Brace Center, Canada), DR.G.Pearce (HR Wallingford, Great Britain), Dr. Mehmud Ul Hassan (Project “IWRM-Ferghana” project manager, IWMI).

Conference goal: Analysis of drainage state in CAR countries and preparation of proposals on strategy of irrigated farming sustainable development and agricultural production improvement in the region.

Salt accumulation processes in arid zone occur under impact of natural (relict salt storage,

shallow saline ground waters) and anthropogenic (irrigation, leaching, return waters) factors.

Relict soil and ground water salinity is one from most important factors of soil secondary salinization on most irrigated area, especially in middle and lower reaches. Artificial irrigation forms salt migration and accumulation in root zone that is main reason for soil secondary salinization and crop yield reduction. In Central Asia more than half of irrigated area is subject to salinization. This requires artificial drainage as min mean to combat salinization.

Due to lack of attention paid to drainage, sustainable land degradation is observed. For instance, during period of 1990-1999 area with shallow ground water (less than 2m) increased:

- for Amudarya basin - from 1,29 to 1,57 mln.ha, or by 280<sup>th</sup>.ha (22 %);
- for Syrdarya basin – from 0,55 to 0,90mln.ha or by 350 th.ha (64 %).

Ahalksky and Dashhovuz veloyats of Turkmenistan have highest growth (149 and 31%), Navoy n (43 %), Samarkand (24 %) and KKhorezm (22 %) oblasts of Uzbekistan, South Kazakhstan (200 %), Dzhizak (84 %) and Syrdarya (72 %) oblasts of Uzbekistan.

Medium and strongly saline sharply increased. These areas increased:  
for Amudarya basin – from 1,16 to 1,82mln.ha or by 660 th.ha. (57 %);  
for Syrdarya basin - from 0,34 to 0,61mln.ha or by 270 th.ha (79 %).

Drainage workability coefficient for 1990-2000 reduced by 30 % and under this trend more than 50 % drainage systems will be out of operation by the half of XXI century. According to lead experts, damage from drainage poor operation amounts for 1bln.USD annually.

Conference was opened by the First Deputy Minister of Agriculture and Water Resoures of the Republic of Uzbekistan A.A.Jjalalov. He told about development issues and water infrastructure, reclamation state of irrigated lands, role of drainage in land reclamation, investments in drainage.

Key reports were made by prof.V.Dukhovny (Drainage in Central Asia); prof.Kh.Yakubov (SIC ICWC, A.Abirov (SANIIRI) (Modern problems of vertical drainage operation); M.Mirhodjiev (Ferghana valley – issues and potential of progress); Dr.H.Denecke (Perspective of irrigated agriculture development); prof.Abdel-Dayem (WB vision on investments in drainage systems); prof.C.Madramootoo (Integrated drainage and irrigation management); G.Pearce (Role of international programs for benefit of beneficiaries); Dr.V.Visvanatha (Review of the Aral sea basin potential needs in drainage).

Participants presented 12 reports on typical drainage zones in the region:

- Kazakhstan: Kyzyl-Orda and South-Kazakhstan oblasts;
- Kyrgyzstan: Osh oblast;
- Tajikistan: Sogd oblast;
- Turkmenistan: Tashauz oblasts;
- Uzbekistan: Ferghana valley, Bukhara, Kashkadarya, Syrdarya, KKhorezm, Surhandarya oblasts and Karakalpakstan Republic.

Totally 30 reports on drainage issues were heard at the conference.

In irrigated zone drainage network is a part of reclamation system including irrigation network, creating favorable water-salt regime for crop growing. In this connection, drainage should be considered together with IWRM. IWRM concept includes collector-drainage network management. From this position, IWRM includes:

- coordination of management levels in vertical and horizontal direction;
- inter-sector approach;
- public participation in water management and use;
- ecologic requirements provision;
- sustainable functioning provision,

IWRM economic and resource aspects include integration of:

- water supply to irrigated lands and water removal from them;
- interaction of different types of drainage (open, subsurface, vertical);
- surface, ground and return water management and use.

Factors directly influencing main parameters of collector-drainage systems:

- scientifically grounded water supply limitation;
- losses reduction during its distribution within inter-farm network;
- irrigated fields leveling and furrow length optimization;
- maximum reduction of releases from irrigated fields;
- loading on drainage reduction through sub-irrigation;
- open and accessible information for all concerned parties.

Logic consequences of above factors are following:

- water users responsibility for undertaken actions;
- organizational forms of common drainage and irrigation management;
- forms of water users participation in drainage management.

Opinions of participants regarding common drainage and irrigation management divided. Understanding necessity to charge water organizations to manage drainage, there were another opinions:

- establishing new structures for salt management is inexpedient under WUA availability – this function is naturally belongs to WUA (Tajikistan);
- statute of water organizations will change with transition to IWRM; they must manage salt; economic incentives should be worked out to stimulate reclamation improvement (Turkmenistan);
- inter-farm drainage systems operation should be responsibility of state organizations and on-farm systems – should be WUA responsibility. During nearest 5-10 years farmers can't settle this problem themselves (Uzbekistan).

Kazakhstan and Kyrgyzstan representatives supported salt management by WUAs (including on-farm systems); successful market reforms permit count on it. At the same time, it was underlined that for first time state support is needed because most farmers do not pay attention to land reclamation state. Large collector-drainage systems also should be supported by the state.

Under existing conditions, riparian countries have no enough financial means in order to maintain sustainable drainage functioning. Presently, lands are salinized not only in Amudarya and Syrdarya lower and middle reaches but also upper reaches (Surhandarya, Ferghana, Namangan, Hatlon and Sogd oblasts). Dangerous sources of salinization origi-

nated within irrigated lands where previously there was stable soil desalinization (Mahtaaraal zone in South-Kazakhstan oblast, Western part of Hunger Steppe in Uzbekistan).

Participants mentioned public participation as one from most important tasks. Examples were demonstrated when drainage was maintained properly on base of water users and local authorities participation.

Due to lack of finance, all types of drainage are in critical state. Since first half of 1990-es vertical drains are not rehabilitated. In Kashkadarya oblast in 2000 only 7% of vertical drains and 3% of combined drainage wells were in operation.

Open drains are not cleaned, especially on-farm collector-drainage network. Funding of these measures constantly reduces.

Discussion revealed following drainage issues in the region:

- no development under drainage infrastructure ageing;
- lack of finance for drainage O&M;
- disconnection of drainage management and operation especially in transboundary basins and multitude of water users;
- weakening of technical base of organizations previously responsible for land reclamation;
- as consequence, irrigated crops yield reduction.

Topical questions within IWRM context are following:

- water demand control;
- operation and assessment of on-farm collector-drainage network state;
- insufficient drainage water re-use;
- weak control over irrigated area water-salt balance;
- WUA support and their responsibility for command area;
- interaction between water and reclamation organizations;
- necessity to manage ground and return water and water disposal;
- low technical and financial ability of water organizations.

Taking into account necessary significant investments in drainage (2-3bln.USD for 20-30 years, H.Denecke), participants noted importance of prioritizing measures in short, medium and long-term perspective.

- organizational: change or reorganization of managerial structures, involvement of water users in salt management process;
- laboratories equipment, observation network rehabilitation, technical base renewal, GIS technology application;
- rehabilitation: low-cost rehabilitation methods;
- agro technical: salt-resistant crops, crop rotation, bio-drainage;
- water-related: drainage water use for irrigation, sub-irrigation on lands with shallow fresh and brackish ground water.

Participants consider following questions as most important:

- objective analysis of drainage state to define need and succession of rehabilitation, reconstruction and new construction;
- revision of existing construction technologies and methods regarding their feasibility under present conditions (tubes, filters, drainage parameters);

- drainage sustainability and durability increase;
- scientific provision, field and theoretical research, modeling and computer technologies, database establishing.

Taking into account financial capability and capital intensity, following investment in drainage succession is considered expedient:

- short-term perspective - slightly saline lands, at edge of medium saline;
- medium-term perspective – medium saline lands;
- long-term perspective – strongly saline lands.

First priority is increasing O&M cost, leaching and drainage cleaning up to normative, which prevent drainage workability decrease lower than 60%. But this is insufficient to provide high land productivity; drainage reconstruction should be started immediately.

Annual volume of this work should reach 500- 800USD per hectare.

Under low agricultural education level of land and water users, participants decided to develop educational programs and special seminars for farmers. This will allow draw attention to low-cost drainage maintenance technologies: agro technical measures, crop rotation, release from fields reduction, etc. It is important inform farmers about indirect drainage effects: rehabilitation volume decrease, high yield sustainability, social and economic aspects. As positive examples, some farms of Bukhara oblast (vertical drainage), Ferghana oblast (subsurface drainage since 1950).

Main priorities are as follows:

- provision hydrogeologic-reclamation expeditions with laboratories, transport, modern equipment, computer technologies;
- drain flushing units rehabilitation and purchase;
- collector, open and subsurface drains maintenance technologies introduction;
- rehabilitation and development of combined drainage, which is easily rehabilitated.

Grant for drainage research is discussed separately. It was underlined that grants are allocated for scientific research and achieving results, which can be used on vast territories. Existing information should be summarized in such way that to convince donors to fund project.

Participants endorsed three project proposals presented by Dr.P.Umarov.

Some foreign participants (prof.C.Madramootoo, Dr.H.Denecke, prof.S.Abdel-Dayem, Dr.G.Pearce, Dr.O. Cogels) assured that they will take active part in drainage issue solution in the Aral sea basin and undertake efforts to rise funding.

*Project proposals prepared by SIC ICWC and approved by conference participants on March 10-13, 2004 are the following:*

1. «Provision of sustainable ecologic security of irrigated lands and river flow in the Aral sea basin (on example of Amudarya basin)».

Project goal: Development and testing strategy of surface, ground and return water and salt accumulation management to support ecologically sustainable profile and river flow in Amudarya basin.

Typical objects: Amudarya river and irrigated lands in its lower reaches (Turkmenistan: Dshhovuz oblast; Uzbekistan: KKhorezm oblast, Karakalpakstan).

Preliminary project cost is 1,11 mln. USD.

2. «Land reclamation perfection during transition to IWRM (on example of Ferghana valley)».

Project goal: Development of technical, organizational and legal principles of drainage, return and ground water management within IWRM on example of integrated water management in Ferghana valley.

Typical objects: pilot objects of “IWRM-Ferghana” project funded by SDC.

Preliminary project cost is: 1,60 mln. USD.

3. «Strengthening potential of reclamation organizations in Kazakhstan, Turkmenistan and Uzbekistan».

Project goal: Creation of technical and technologic opportunities for irrigated lands systematic observations and control; establishing planning, operation and maintenance services for horizontal and vertical drainage.

Typical objects: Reclamation services of Kazakhstan (Kyzyl-Orda oblast, Turkestan and Mahtaaral massifs of South-Kazakhstan oblast), Turkmenistan (Lebap and dashhovuzveloyats), Uzbekistan (Syrdarya, Djizak oblasts in Syrdarya basin , Bukhara, Kashkadarya, KKhorezm oblasts and Karakalpakstan in Amudarya basin).

Preliminary project cost is: 2,0 mln.USD.

Proposals are agreed with ICWC members from Kazakhstan, Kyrgyzstan and Uzbekistan.



## REGULAR MEETING OF GWP TEC OF CENTRAL ASIA & CAUCASUS

Meeting was held in Yerevan, Armenia on April 12-15, 2004.

In RTAC of Central Asia and Caucasus participated 7 countries from 8. Azerbaijan representative could not participate; Turkmenistan representative U.Saparov took part in the meeting first time since November 2002.

Meeting was opened by RTAC Chairman V.Sokolov, RTAC member O.Kirokosyan introduced Minister of Environment of Armenia V.Aivazyan who greeted participants and underlined importance of GWP role in new Water Code of Armenia of 2002 realization. This law is accepted as sign of progress and model of IWRM for other countries of the region.

GWP Secretariat representative B.Guterstam expressed gratitude to the Minister for recognizing GWP and explained GWP objectives in water resources planning and role of national water partnerships in this context.

Questions discussed during the meeting:

ToolBox Version 2 has been translated and 500 copies are made. Participants had feeling that this tool is not yet ready for application by water professionals, managers and policy makers. Participants agreed to start actions within framework of ToolBox project ToR in Central and Eastern Europe, Central Asia and Caucasus (project was suggested by D.Talmeinerova and presented by V.Sokolov). First meeting with group of Central and Eastern Europe will occur in Almaty, Kazakhstan in May 2004.

How to involve society and NGOs in GWP? It was agreed to launch campaign on public awareness in each country.

Rotation process in RTAC CACENA will be started in 2004 taking into account special remark for gender balance.

V.Sokolov's information about EU Water Initiative Moscow meeting (February 2004). There is lack of clear links between EU Initiative construction blocks – funding is not confirmed. Anyway, GWP CACENA should strengthen cooperation with EU Initiative in IWRM and water supply and sanitation area.

PTAC member O. Korokosyan, Armenia was defined as participant of GWP meeting in Malaysia.

Uzbekistan is at initial stage of school program of water related questions integration in traditional school books and teachers training. It is high time to CapNET program and MDG 7 involvement.

Development of national water partnership (NWP) is under preparation. "Involvement conditions" has been translated into Russian. For NWP registration in the country, Stockholm Secretariat confirmation is needed.

Preparation to meeting in Almaty (Regional water Conference, Kazakh NWP and PTKK meeting), which will be held on May 26-28, 2004.

GWP CACENA will start preparation to Ministerial meeting (Kiev process) in Tbilisi in

October 2004.

RTAC CACENA members agreed on preparation of 2000 CD with 4 bases of full collections of official documents and publications in Central-Asian countries for last 14 years presented by V. Sadomsky (REC CA).

Presentation on water related project in Caucasus. It was chaired by Deputy Minister of Environment of Armenia Kh.Matilyan.

M. Vardanyan, USAID told about achievements and perspective of sustainable water resources development in the region in connection with new Water Code of Armenia. In Armenia transition to basin planning including transboundary rivers has been started. Cooperation along national boundaries with involvement of NGOs and women in water resources management is underway. There is success at technical level in information sharing between countries. World Bank and Japan are involved in privatization process. New water agency of Armenia has been established under USAID support. EU TACIS project "Joint management of Kura river" (2002-2004) is a demonstration of Helsinki Convention application. Project includes water specialists training in the Netherlands and laboratorial equipment procurement to the Ministry of Environment.

A. Martirosyan, REC-Caucasus presented database of the project "Environment without limitations" (2002-2006) including water projects, in context of sustainable development. Database and information can be found in Internet ([www.rec-caucasus.org](http://www.rec-caucasus.org), [www.carec.kz/water](http://www.carec.kz/water)).

South-Caucasus cooperation project in river monitoring funded by NATO and OSCE was presented by M Nalbandyan, Armenian Academy of Science. Project includes Armenia, Azerbaijan, Georgia, Belgium, Norway and USA and is devoted to water quality monitoring with 10 monitoring stations in each country. Unfortunately, no information is available for 90-es.

IWRM legal aspects in South Caucasus, prof.A.Isokyan, NGO, Yerevan. Mrs.Isokyan was involved in Water Code preparation. She is optimistic regarding new legislation, public participation, women role, environment protection and its harmonization with other laws on land, forest, lakes, health and sanitary. Representatives of three countries will gather around table in Tbilisi to establish new common information center. One of tasks – joining with Western-European (Caucasus belongs to Eastern Europe) experts for consultations.

I. Gabayan, Bureau of Water Reforms is funded by the World Bank. Project will last up to 2007. Institutional development and economic reforms will cover three main spheres: 1) Irrigation systems rehabilitation; 2) Dams and security; 3) Water delivery to rural area. Urban water supply will receive loans in amount of 90mln.USD. About 70 % of people will be beneficiaries.

L.Gyumishan, State Water Committee presented information about water infrastructure operation for irrigation and water supply. First priority in irrigation is irrigation systems rehabilitation and transition from water lift to irrigation by gravity (head water intakes shift to upper reaches). In water supply and sanitation is its extension both in urban and rural localities. In Armenia all water delivery services are payable. Resent several years water accounting is developing. Water cost is 18cents/m<sup>3</sup>. Fees collection is 80% for Yer-

even in 2003. water delivery cost is 1.5cents/m<sup>3</sup>. Collection rate is 60%.

On April 14 RTAC members' visit the largest lake in the region located at elevation of 1900 m. Sevan lake is protected by special law and is rehabilitated.

RTAC member O. Kirokosyan, Ministry of Environment leads team within the project «Sevan Lake – Action Plan» funded by the World Bank since 1999. It is a base for IWRM planning in Armenia and the region.

Meeting between B.Guterstam, V.Sokolov, M.Boid and M.Vardanyan (April 2004). USAID contributes to Armenia by special law for training activity, for example, on WUA. USAID greets progress in new legislation, IWRM development, which is 5-8 years ahead compared with neighboring countries. It is very important to support regional cooperation and use Armenian experience as a model.

Meeting of B.Guterstam and V.Sokolov with JINJ Co. Ltd, April 15 2004. This company specializes in water infrastructure management and environmental assessment. JINJ plays key role in national database creation using new technologies. Armenian water resources planning is harmonized with European Water Directive principles. Caucasian water resources are taken into account only in aspect of quantity. Integrated river basin planning meets criteria of sustainable development. In accordance with water legislation, first basin council will be established in Debed river basin in Armenia and Georgia, which is Kura tributary. B.Guterstam gave lecture to JINJ workers on sanitary and wastewater re-use all over the world.

Conclusion:

GWP-CACENA created impulse (push) by working plan approved in Tbilisi in December 2003. Political awareness and will was shown in Armenia like GWP meetings in Georgia, Tajikistan and Kazakhstan.

RTAC members take full responsibility for national water partnership establishing. They need strong support from regional and central FWP Secretariat.

Forthcoming event with launching National Water Partnership in Kazakhstan and IWRM national planning work program funded by Norwegian government will be big step forward for GWP-CACENA.

## ICWC TRAINING CENTER WORKSHOP «IRRIGATED FARMING PERFECTION»

Aral sea basin has one of the largest irrigation system. Millions of people living in the basin depend on irrigated farming. GHP includes 20-60% input from agriculture.

After USSR collapse agricultural income quickly declined. Governments carried out reforms trying improve situation. Aimed at food security reforms in agriculture were conducted very quickly. Water reforms were started later and separately from agriculture.

In result of agricultural reforms number of water users grew rapidly that aggravates water distribution and allocation.

In Soviet time land reclamation, water management and technical support were performed at expense of state budget. With transition to market economy need to change approach appeared. Many former in-farm irrigation and drainage network became inter-farm. Presently O&M cost must be covered by farms themselves through WUA. Unfortunately, many farms can not afford these expenditures. In this connection, state support and governance are needed. Crop pattern also changes that requires new approach.

Recent changes in water and agricultural sector made it necessary special training for water specialists to share advanced irrigation technologies and technique. Water resources scarcity during growing season and frequent alternating dry and wet years also require new irrigation methods.

Workshop «Irrigated farming perfection» was carried out on February 9-13, 2004. Training program envisaged opinion exchange within 6 modules:

General issues of irrigated farming;

- Irrigation;
- Water management transfer;
- Reclamation and operation;
- Program complex for irrigation management.

First Deputy Minister of Agriculture and Water Resources of the Republic of Uzbekistan A.A.Jalalov and ICWC Training Center Director P.D.Umarov took part in the workshop opening ceremony

Workshop was aimed at conditions creation for experience sharing between practitioners and scientists of middle level from all five countries of the region. Participants were presented by reclamation expeditions and scientific-research institutes' collaborates.

It was noted that lack of finance is main factor of irrigated lands state aggravation and causes range of interconnected issues:

- soil degradation especially in lower reaches;
- drainage systems' ageing due to poor maintenance.

Participants mentioned necessity to inform water users about water saving methods. Water resources management transfer to public bodies requires creating a base for actions. Society should be prepared to transfer process. Extension service is well developed mechanism helping this process by consultation about crop pattern planning, business-

plan preparation and legal issues.

Range of proposals and recommendations on effective irrigated farming were given to participants. In particular, following recommendations on crop cultivation technologies were given:

1. Irrigated plots certification based on large scale soil-reclamation survey fixing plot use, its surface state, boundary conditions and other factors determining its productivity and potential.
2. Combination of measures (reclamation and agro technical) providing plot evenness as an object of reclamation measures defined by certification:
  - plot leveling;
  - improvement of soil water-physical properties (permeability, water capacity) by feasible measures;
  - creation and provision (by leaching regime and drainage) salt concentration permitting crop cultivation;
  - irrigation technologies: irrigation frequency determined by soil water-salt regime and irrigation regime and condition of even moistening and allowable salt concentration (using distributed water supply, shortened furrows (100-200m) and surge irrigation);
  - drainage necessity and regularity (provision drainage in case of heavy soil within irrigated plot);
  - special measures on field spottiness elimination.

Many demonstrative-experimental plots were abandoned due to lack of financing. Water saving propaganda and climatic changes require reanimation of these plots.

Water is limited resource, each drop of which should be used effectively. Ground water share in total water diversion is 8-10 %. Near 50 % of rural water demand is satisfied by ground water. Participants expressed their concern about ground water pollution.

Among measures directed to water re-use are the following:

- use of collector-drainage water of allowable concentration;
- subsidizing energy used for ground water pumping.

Among measures directed to water losses reduction in irrigation network are the following:

- intensive methods of crop cultivation (deep ploughing, chemical and organic fertilizers application, crop rotation);
- even moistening and soil and ground water desalinization through size selection and land leveling;
- crop pattern revision with regard to ecologic, economic and social conditions;
- saline land retirement;
- regular cleaning of inter-farm and in-farm collectors;
- necessary state support of drainage network and inter-farm collectors;
- young specialists training.

Following measures are suggested as economic incentives:

- strengthening status of regional organizations;
- gradual introduction of basin-hydrographic principles of water resources management;
- increase of state assistance and measures development on water objects O&M;

- increase of farmers support through subsidies to provide their competitiveness in the world market.

Following measures on water saving are deserve attention:

- gradual limits cutting at national and oblast level;
- water users mobilization and public control bodies establishing including all levels from basin to rayvodhoz;
- WUA establishing on base of unified farms. WUA must participate in water rotation and limited water use;

## **INTEGRATED WATER RESOURCES MANAGEMENT**

Working seminar “Integrated water resources management at rayon level” was held on February 16-19, 2004 in ICWC Training Center. Participants discussed existing problems and made proposals on IWRM introduction on place.

From the first day of independence Central-Asian countries began to reform land use and agriculture; in result of that thousands of water users appeared. Some gap between reforms in agriculture and water sector occurred. This caused in-farm reclamation network state aggravation.

Recent years, transition is being carried out in water sector of Uzbekistan to basin principle in water management. That’s why it is necessary to acquaint water specialists with main principle basin management. With this purpose Training Center and MAWR organized seminar devoted to IWRM.

Seminar was opened by Kh.Gapparov, MAWR water balance department head, P.Umarov, Training Center Director and Z.Juraev, MAWR water balance department deputy head. Participants were presented by water specialists and scientists.

During seminar participants were acquainted with different aspects of water resources use in Central Asia and new model of water use plan.

A) It was noted, that water users’ rights stipulated in water laws are not always observed. Often administration intervenes and negatively impacts public opinion about water conservation. For IWRM introduction is necessary to prepare legal base of IWRM application in CAR.

In spite of reforming during long time, there are issues with ownership of agricultural organizations. Even where WUA are established it hinder their functioning.

Measures proposed by participants for situation improvement are following:

- perfection of water legislation, investment and fiscal policy to facilitate IWRM introduction;
- development of clear ground and base for water conservation incentives creation for water users;
- clear definition of rights and obligations of agricultural organizations in accordance with their form of ownership.

B) Partial transfer of authorities from water organizations to water users is topical.

Social mobilization for rational water use is very important. Its levee can be public access to information that facilitates public awareness about water reforms, young people education using following methods:

- water campaigns and special events;
- special radio and TV translations;
- free access to information;
- work with school teachers and kindergarten staff;
- women participation in public opinion formation.

Participants proposed following specific measures:

regional conferences, workshops concerning IWRM concept with NGO involvement:  
preparation and dissemination of materials about IWRM concept for public awareness with NGO assistance;  
introduce “IWRM” discipline in higher education institutes to prepare young people;  
establish public council of basin regulation;  
series of workshops in oblasts to disseminate IWRM ideas.

C) Transition to basin principle was evaluated by participants as positive step. Unfortunately, current economic situation does not allow provide sustainable development of water sector. Participants suggested practical measures for improvement of water sector economic and technical provision:

- define possible mechanisms and sources of financing, create a base for fund rising;
- subsidizing main canals, advanced irrigation technique and vertical drainage both by state and concerned parties;
- paid water use based on block-tariff scheme;
- gradual WUA mechanical park improvement through lease, loans and other agreements.

D) Participants recommended following measures on water conservation:

- use control acts of water use between oblasts and rayons;
- develop mechanism of water users stimulation for water saving through bonuses, tax privileges and other incentives;
- extension service development for farmers on field certification and water productivity increase;
- wide application of information technologies and planning programs as well as water consumption control;
- strict observance of agro-reclamation requirements;
- in-farm water account and irrigation regime observance.

## **INTEGRATED WATER RESOURCES MANAGEMENT IN TRANSBOUNDARY BASINS: INTERSTATE AND INTER-SECTOR APPROACH**

Scientific-applied workshop “Integrated water resources management in transboundary basins: interstate and inter-sector approach” was held on February 23-27, 2004 in Bishkek organized by International Water Law Institute Dundee, Great Britain, SIC ICWC and MAWR of Kyrgyzstan under NATO support.

More than 50 participants took part in this workshop – heads of water organizations, NGO representatives and water users, water specialists from Russia, Great Britain, USA, France, IWMI and SDC.

Workshop goal –organize meeting of world-known specialists for cooperation in IWRM improvement. Discussion of international experience in IWRM introduction promotes scientific knowledge use for national legal and political approaches development. This



will help ecologic stability in the Aral sea basin and facilitate efforts in IWRM principles' guidelines development

Five ministers and experts made presentations on water resources management, technical aspects, water law and power engineering.

Workshop themes were as follows:

- IWRM international practice;
- assessment of water allocation mechanisms at national and international level;
- IWRM role in poverty eradication;
- joint water resources governance;
- measures on international cooperation improvement

Workshop was organized as series of expert panels.

Upon discussion participants agreed that:

1. IWRM is important direction and tool of water sector development aimed at effective "water governance" in accordance with MDGs accepted in 2002.

2. Water use and management at international and national level should be carried out in accordance with the following principles:

- achievement of sustainable development in all economic sectors;
- river basin management on base of hydrographic principle with regard to all types of water - surface, ground, return - and climatic changes;
- water conservation at all levels in all uses;
- -priority of "human basic needs" and ecosystems;
- poverty eradication among rural population;
- public participation in decision making including financing and functioning, transparency, exchange and access to information at international, national and local level.

3. Efficiency of "water governance" regional system in the Aral sea basin depends on political will and readiness to compromise of all riparian countries as well as availability of water resources management authorized body.

4. Water law role is very important. It is main social tool providing "water for all" in three varieties: international, national and trans-national law.

5. IWRM realization at regional level is impossible without creation of effective legal, institutional and technical base of interstate cooperation by further development of regional tools, strengthening equal representation from all countries, new mechanisms creation for transboundary water resources management and conflict resolution.

6. IWRM international legal base can provide equitable, reasonable and ecologically sustainable water allocation and use regime. Agreements on interstate cooperation (legal assessment methodology developed by Dundee Institute) can be used as a model for international treaties preparation.

7. Development of international water law on transboundary rivers in the Aral sea basin should be accompanied by regional cooperation mechanisms perfection. It is expedient to strengthen status of regional bodies.

8. Recognition of each state sovereignty regarding transboundary water resource located within its territory does not eliminate necessity to take into account interests of another states and environment requirements for bioproductivity and biodiversity maintenance. Water related activity planning and implementation within one country should be per-

formed with regard for international obligations including equitable and reasonable water use and damage avoiding.

9. Recommend to reduce water consumption in order to achieve specific water diversion decrease by 15-20% by 2025 that will permit satisfy energy demand of flow formation zones and irrigation and wetland preservation in middle and downstream. .

This activity should be combined with prevention of climate change negative impact (drought and flood) and economic mechanism of paid water use introduction.

10. IWRM at national level requires development and perfection of national water legislation and adjacent branches (land, environment, entrepreneurship). Different level of political, social and economic development should not be an obstacle for rapprochement and national water law “unification”.

11. Along with legal and organizational measures, water use and distribution planning technology with water users participation; SCADA system introduction on main canals, water saving system and paid water use are very important.

12. IWRM implementation in the Aral sea basin should be accompanied by target efforts in specialists (civil engineers, hydrologists, lawyers, economists, ecologists) education and training, including preparation of “water leaders” capable to provide effective “water governance” for long-term perspective.

13. Public awareness should play special role in IWRM implementation.

Detailed report on workshop can be found on SIC ICWC web-site: [www.sic.icwc-aral.uz/news/rus/09032004.htm](http://www.sic.icwc-aral.uz/news/rus/09032004.htm).

## **WORKING SEMINAR WITHIN THE PROJECT “STRATEGIC PLANNING AND MANAGEMENT”**

Working seminar on strategic planning and management was held under leadership of prof.V.Dukhovny on February 26, 2004 (“Strategic plan of IWRM introduction in Ferghana valley, Amudarya and Syrdarya downstream”).

IWRM principles were discussed during workshop in Cholpon-Ata on August 26-28, 2002 and in Tashkent on November 26-28, 2003.

Participants noted positive experience of IWRM introduction on pilot canals of Ferghana valley and decided to implement it in Ferghana valley and Amudarya and Syrdarya downstream.

With this purpose SIC ICWC has prepared and agreed with ESCAP ToR for preparation proposals on strategic plan of IWRM principles realization for national coordinators and questionnaire explaining ToR provisions.

Proposals on ToR were received from Kazakhstan, Kyrgyzstan, Tajikistan and Uzbekistan.

It was noted:

- Kazakhstan proposals mostly correspond to ToR and questionnaire requirements;
- Turkmenistan national coordinators did not submit their proposals;
- proposals and comments were summarized and sent to national coordinators;

- deadline for new proposals submission was defined – March 15, 2004.

## **KICK-OFF WORKSHOP AND STEERING COMMITTEE MEETING «CENTRAL-ASIAN REGIONAL INFORMATION BASE OF WATER SECTOR (CAREWIB)»**

Kick-off meeting with participation of SIC ICWC, SDC, ICWC Secretariat, SIC SDC, UN EEC, GRID-Arendal and project national coordinators was held on February 28, 2004.

BY J.Gely (SDC) proposal, kick-off workshop was united with first meeting of Steering Committee (PSC).

CAREWIB project goal is improvement of water and environmental sectors information provision in Central-Asian countries. It will help to maintain information “transparency” and form public opinion for sustainable development and partnership in national water resources rational use.

Priority task is creation of regional web-portal with regularly renewed information about water related situation and ecologic issues in Central Asia.

Second direction is establishing multi-level, interstate, inter-sector information system on water and land resources. This system is based on water and land resources management hierarchic levels as well as water resources formation and use. Its main objective is establishing - on base of modern equipment, software and communication – common information system including data about water resources formation, development and prediction, assessment of different water use aspects and measures on potential efficiency achievement, sustainable management provision and economic activity productivity increase.

It is supposed:

- strengthening existing database and its integration with national databases like BWO “Syrdarya” and “Amudarya” dispatch database and its transformation into corporative system of water and land resources account, analysis and use;
- improved information capacity, data reliability and completeness;
- widening functional possibilities and system effective reliability;
- developed and strengthened partnership between information suppliers and users;
- wide and free access to information.

SIC ICWC, BWO “Syrdarya” and “Amudarya”, ICWC CMC and Training Center information is a base for web-portal. Communication with other information sources (SPECA, REAP, ENVSEC, etc.) as well as Hydromets of Central Asia is supposed.

SIC ICWC realizes CAREWIB project in accordance with “Agreement between Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan and Uzbekistan on creation and operation of shared national, basin and regional databases” signed by ICWC members.

GRID-Arendal and UN EEC will introduce international experience of information acquisition using modern information technologies meeting Rio Declaration (principle 10),

Agenda-21(Article 40), UN EEC Convention and World Action Plan of sustainable development requirements. Region's potential will be strengthened by permanent network of regional respondents.

Thirteen oblast water organizations from five countries (6 from Uzbekistan, 2 from Kazakhstan, 2 from Turkmenistan, 1 from Kyrgyzstan and 2 from Tajikistan) are involved in the project framework, which will be equipped by computers for information collection, processing and transmission. These organizations will build information network, to which all oblast water organizations will be joined.

Participants agreed:

- UNECE and GRID-Arendal will provide SIC ICWC with correspondent international information;
- SIC ICWC will prepare project of portal users review for discussion and consideration; result will be used as guideline for portal establishing (tentative list of users' groups, decision-makers, water experts, NGOs, lectors and teachers, mass-media, interstate organizations and donors).
- GA и UNECE will give comments regarding ToR for national respondents, information classificatory suggested by SIC ICWC and portal design.
- workshop will be organized by GRID-Arendal and SIC ICWC for web-design and publications format discussion in detail. Workshop will be held in first half of 2004 in Arendal or Tashkent.

Main version of CAREWIB portal will be in Russian. Only sections selected by consultations, analysis by target audience and users' information will be translated into English.

Partners will take into account following SDC expectations:

- high editorial quality of texts;
- available high quality substantive information;
- high visual presentation quality;
- permanent interaction with donors.

SDC will help communication between CAREWIB and other projects funded by SDC like hydromet services including Regional Hydrologic Center. Direct access to observed and predicted data of this center ("hydromet windows") is supposed within CAREWIB.

GA and UNECE will prepare letters to potential partner organizations ( for instance, direct consultations within Almaty conference).

Administrative questions:

- inception report should be prepared to April 2004 (SIC ICWC together with UNECE and GA);
- working plan for next year should be submitted jointly with annual report;
- at the end of each calendar year (November – January)Steering Committee meeting should be carried out.
- partners should as soon as possible to complete and submit to SDC work plan for 2004 and budget distribution over years (according to agreement, annex 1);
- SDC must be informed by written notification about any redistribution within budget more than 10%.

Next meeting and tentative list of participants:

- CAREWIB presentation to IFAS Board, Dushanbe, March 27 (Johan Gely, Victor Dukhovny; J.Gely will apply to IFAS on this matter);
- donor meeting on Aral sea basin problem, May (Johan Gely, Bo Libert);
- CAREWIB consultation with information suppliers within Almaty conference (maybe with water users), Almaty, May 26-28 (SIC ICWC, Nikolai Denisov);
- workshop on web-design/graphic data display (SIC ICWC and GA, maybe others), Ar-  
endal or Tashkent, place and date to be defined.

Central portal site design prepared by SIC ICWC will be considered. Site consists of following sections:

- 1) News block –information about current events in the region and abroad; reviews and expertise of most interesting web-sites, publications, etc.
- 2) Catalogue of water and ecologic sites (local and foreign).
- 3) Information system on water and land resources of the Aral sea basin.
- 4) Base of knowledge (bibliographic database and electronic library).
- 5) Database of current and future policy, strategy, programs and projects of national governments, NGO and regional organizations, donors and agencies in water and environment field.
- 6) Calendar of events – information about conferences, exhibitions, congresses, symposia, etc.
- 7) Service of information dissemination.
- 8) Forum for regional issues discussion.

Detailed report on workshop can be found on SIC ICWC site: [www.sic.icwc-aral.uz/news/rus/09032004.htm](http://www.sic.icwc-aral.uz/news/rus/09032004.htm).

## **CANALS AUTOMATION IN FERGHANA VALLEY**

Kick-off seminar for the project “Canal automation in Ferghana valley” was held in Tashkent on March 2, 2004.

Seminar goal – discussion of the project first phase and coordination of ToR for pilot canals’ operational staff, BWO “Syrdarya” objects and regional group experts.

Prof. V.Dukhovny opened seminar. J.Gely (SDC) noted that SDC considers project as important complement element of IWRM development in Ferghana valley and that this project must become an example for next similar projects.

Prof.V.Dukhovny in his report explained project objectives and tasks and informed participants that proposals made last year are coordinated with ICWC members and preparatory stage was launched on march 1, 2004.

Project consists of two parts:

- BWO structures equipment by automation system similar to used in Uchkurgan water work;
- automation of linear structures –canals has specific features and different requirements to automation elements (water work automation and balance sites’ monitoring).

Development of second part has no analogue and there is necessity for close coordination with water distribution technology within “IWRM-Ferghana” project.

M.Khamidov, Director BWO “Syrdarya” told participants about BWO objects automation: Dustlik, South Golodnostep canal, Verhnechirchik and Uchkurgan water work. Achieved parameters’ measurement accuracy and regulation algorithm will permit significantly increase water distribution accuracy and save water.

BWO has already fulfilled significant volume of work on structures preparation to automation (31 from 45th.USD) and is ready to mount equipment. All objects of Naryn-Karadarya administration will be united in common automated management system.

A.V.Legavko, Director SIGMA reported about main canals automation and dispatch. He informed in detail about Pahtaabad canal automation and demonstrated new automation technical means (ultrasonic water level sensors, gate position sensors and controllers). He drawn attention to probable problems with telecommunication system –decision-making, equipment procurement, permission for radio communication.

I. Begimov – regional group expert noted positive experience of water works automation in Ferghana valley and on South-Golodnostep canal and informed about work program for future.

F.Ya. Einhorn - regional group expert informed participants about ToR for regional group specialists.

N.N.Mirzaev – “IWRM-Ferghana” project, component “Pilot canals” leader reported about canal water committees establishing and links with water users.

O. Tuichiev – Aravan-Akbura canal administration head told about hydrostructures (construction and mechanical parts, electric supply system) and gauging stations readiness to automation. Presently, building for Aravan-Akbura canal administration office is being selected. Control stations will be located on headwork, at DP-70 and in administration building.

R.A.Rustamov – South-Ferghana canal’s administration head informed about canal’s objects readiness to automation. Control stations will be located on main water works, hydrosites and in administration building (totally 10-12). He suggested to take into account Karkidon and Kurgantepa reservoirs operation regime during development of water distribution technology and possibility of structures automation. Special attention was given to development of SFC common communication system because now two oblasts’ system is used.

A.K.Boboiev – Khojibakirgan main canal administration head reported about canal’s objects readiness to automation. He drawn attention of participants to available company in Khojent, which develops communication systems. On base of discussion correspondent decisions are made.

## ABOUT 'IWRM-FERGHANA' PROJECT PROGRESS

Series of kick-off workshops were carried out on March 4 in Khojent, on March 6 in Ferghana and on March 7 in Osh. Workshops were devoted to observations conducting, information about irrigation water use and agro technical measures collection and pilot farms monitoring.

Sh.Muhamejanov, leader of activity "Water and land productivity at farm level" greeted participants and told about workshop objectives and work plan for 2004. Dr.Muhamejanov summarized results of monitoring on irrigation water use on demonstrative plots of three oblasts.

Main task for 2004 is confirmation of positive results sustainability. Besides, dissemination of positive experience on water and land productivity increase among adjacent farms, data collection on these farms, issues revealing and solution. All this will be a base for future extension service.

Oblast executors discussed question about water account and uneven charges practice in Kyrgyzstan. In spite of significant water saving on demonstration plots, water charges were equal for all farms. In this connection, it is expedient to install water metering devices and revise water charges policy.

Senior lecturer of Osh TC B.A.Toktoraliyev noted, that there is big problem with agricultural chemicals in Kyrgyzstan. Due to this fact and poor farmers knowledge about crops phenology, high yield losses occur (up to 30%).

S.A.Nerozin summarized monitoring on pilot plots in Osh oblast and gave recommendations on technologic operations, fertilizers application, crop protection from diseases and pests. Comparing indicators of 2002 and 2003, conclusion was made about water and land productivity management improvement. Analysis of variable costs, mistakes of executors, reasons of yield losses and recommendations on agricultural production sustainability increase in pilot farms were given.

Optimal sowing terms, seed quality, fertilizers application questions were discussed.

Then Sh.Muhamedjanov, S.Nerozin and A.Galustyan carried out consultations with farmers on initial information collection, processing and analysis. Participants were given field journals for 2004 and special forms to be filled in for future extension services establishing. Participants discussed questions connected with preparatory work on extension service establishing, suggested amendments and additions to prepared forms.

Working meeting for project executives was held on April 17, 2004 in SIC ICWC. Participants considered work plan fulfillment in 2004; activity leaders gave brief information about tasks fulfillment and work plan for future.

Exchanging opinions participants came to following conclusion:

"IWRM Concept" publication is planned for June 2004. Prof.V.Dukhovny trust Dr.T.Palvanov to prepare new leaflet "IWRM-Ferghana", in which accumulated project experience and perspective should be reflected.

General meeting with participation of national coordinator from Uzbekistan U.A.Azimov,

oblast coordinator P.K.Rasulov, oblast executor O.Khalikov and WUA staff was held in WUA “Akbarabad” on April 15, 2004. Questions of contract conclusion with water users, WUA financial state, construction of new additional gauging stations on irrigation network within WUA, electronic network operation were considered. Following conclusions were made: WUA Council should consist of 3 shirkat leaders, 1 representative of Shahimardan administration, 2 farmers’ representatives and 1 representative from kishlak council.

There are 55 water users in WUA “Akbarabad”, from which 45 private farms, 3 shirkats, 6 mahallyas and 1 farm of rayselhozchimia. In mahallyas mirabs were appointed for equitable water distribution among farmlands. Water use plan prepared by project staff was accepted by WUA and passed to water organization. On base of this plan contracts on water delivery were concluded for 2004. Water users submitted applications for forthcoming period. This proves water users’ interest to WUA.

Consultant-hydrometrist R.Masumov reported about activities within April 6-16:

- on pilot canal Khojibakirgan – field inspection of balance gauging stations and outlets;
- collection of discharge characteristics for analysis of empirical data error, gauging stations certification, certificates inventory;
- on pilot canal “Akbarabad” – gauging stations construction has been completed, 38 certificates have been prepared, rest will be ready by the beginning of growing season 2004;
- “Zerafshan” - gauging stations construction has been completed, certificates are being prepared;
- “Zhapalak” – work schedule of gauging stations construction has been prepared, 8 stations have been built additionally to 38 existing ones, to the end of month another 30 stations will be completed.
- “Kermetoo-Akburasi” – inspection together with Dr.Abdullayev showed that only 7 from 14 outlets have satisfactory state, rest should be repaired or build IWMI representative Dr. Abdullayev informed that IWMI allocates financial means for weirs construction and 30 metering sticks purchase. Head gauging stations construction will be carried out by canal administrations jointly with WUA.

Gauging stations construction on demonstrative canals will be carried out by WUAs after hydrometric equipment delivery. Work should be completed by May 1.

Leader of activity “Water and land productivity” Sh.Muhamejaniov reported that presently cotton sowing is under preparation. It is planned for April 20. Laser land leveling and soil deep loosening have been completed. Points of water measurement are defined, water meters will be installed within a week.

Recharge irrigation after leveling will not be conducted. Organic fertilizers will be applied in amount of 50 t/ha. There is some delay in winter wheat development due to late sowing. Soil sampling is made to analyze them for nutrients. Recommendations on fertilizers application and irrigation are given.

In conclusion, prof.V.Dukhovny drawn participants’ attention to canal and WUA management, which impacts canal automation. Necessary measures should be undertaken by appropriate activity leaders.



## **PROSPECTS AND POTENTIAL FOR IMPLEMENTING IWRM PRINCIPLES IN THE AMUDARYA RIVER BASIN**

On 23-26 March 2004, a regular eighth workshop dedicated to prospects and potential for implementing IWRM principles in the Amudarya river basin was held in ICWC Training Center in Urgench.

The main objective of the workshop was to inform on the subject.

The workshop was supported by CIDA. The chief of BWO «Amudarya» opened the workshop. R.Deker, manager of Yakima-Teiton irrigation district, member of WUA Council in Oregon, as well as representatives of USAID NRMP Project took part in the workshop.

The following presentations were made:

1. Integrated water resources management in Central Asia and relevant development objectives.
2. Present water management and use problems in Central Asia.
3. Characteristics of water management in the Amudarya river basin.
4. Water control in irrigation systems.
5. Selection of optimal land reclamation regimes and drainage parameters under conditions of KKhorezm oblast and the Republic of Karakalpakstan.
6. Enhancing the on-farm irrigation system management through establishment of Water User Associations.
7. Geographical information systems as applied to water management.
8. Water assessment at present stage in transboundary watercourses of the Amudarya river.
9. Reclamation service – the state of the art and the future prospects.
10. Future situation in the region. Simulation of water development in the Aral Sea basin.
11. Water partnership and implementation of integrated water management.
12. Assessment of existing interstate collaboration in water management in the Amudarya river basin.
12. Return water formation, use and forecast in view of water shortage.
13. International water management experience.
14. Legal aspects of integrated water management.
15. Experience of water users association using KKhorezm oblast as an example.
16. Shift to hydrographic approach in water management in Uzbekistan using Lower Amudarya Basin Water Authorities.
17. Good leaching – guaranty of soil desalination.
18. International water law.

The participants addressed problems arising when shifting to the hydrographic approach in Central Asia.

The rational water use is the key element during shift to IWRM. To this end, the participants considered good water accounting as very important. It was stressed that current gauging stations leave much to be desired and water accounting in on-farm systems is un-

satisfactory. Lack of meters in addition to the fact that most primary water users (farmers) poorly or do not know at all about hydrometry principles make situation regarding water accounting more complicated. Thus, there exists an urgent need for WUA and primary water users to train in fundamental hydrometry, equip with meters and install gauging stations, weirs, etc.

Great attention was paid to information on establishment and functioning of Water Users Association. Presentations of WUA's representatives from Oregon state and Yakima-Teiton irrigation district were of particular interest. USA representatives noted that despite the fact that WUAs were established long time ago and exclusively on voluntary basis, they annually faced problems related to various natural, economic, and environmental factors.

The participants marked that the workshop helped them to understand problems of mid-stream and downstream users related to quality and quantity of water flowing from upper watershed and well as to share their problems.

## **WORKSHOP ON WATER AND AGRICULTURAL MANAGEMENT UNDER CONDITIONS OF CLIMATE CHANGE**

A scientific and practical workshop on Water and Agricultural Management under Conditions of Climate Change was organized by SIC ICWC and held in shirkat farm "Rakhmonov" on 23 March 2004.

38 farmers of the shirkat farm, the chairman of the shirkat farm, representative of Ferghana oblast Khokimiyat (local authority), and managerial personnel of the shirkat farm took part in the workshop.

The objective of the workshop was to bring together farmers and SANIIRI's researchers who specialized in water management issues, water and land productivity, and water conservation technologies, to inform the participants on progress made by researchers in improving the irrigation and water conservation methods, as well as to get to know about farmers' problems and to find the ways to solve them.

Presentations were made by researchers involved in Climate Change Project on the following topics:

- integrated water resources management - a way for improved water productivity;
- water and climate change;
- improvement of water- and land productivity;
- water conservation technologies;
- experience in using mulch in farms in Ferghana Valley.

The discussion was held where the farmers stressed their actual problems related to water- and land use efficiency, as well as organizational aspects of crop growing and ways for improving crop yields under conditions of climate change.

The following issues were addressed at the workshop:

Summarizing experience gained within Climate Change Project in water and land use and

yield improvement under increasing water shortage and water demand due to climate warming.

Water delivery to farms was addressed. There is less water available to downstream farms.

There is a need for field passports. These will include both field characteristics and irrigation dates and depths, fertilizer application recommendations, etc. The passports must be updated every 5 years.

There was identified a need for revision of site quality-classes in some farms. Site quality-class is over-estimated and, as a result, crop production plans are too high.

The use of film in crop growing was discussed. Positive effects of the film are decreased water evaporation and thus water saving. Besides, higher yields are achieved in plots covered with film, and, as a rule, more profit is gained.

An issue related to adequacy of cotton varieties to soil types in particular farms.

Gender issues and social justice. Involvement of women in production activity and public works.

As a result of discussion of the above-mentioned problems, the following conclusions were made:

1. At present, it is essential to use water rationally – the more efficient water use, the more water will be flown to the Aral Sea. Thus, the main objective is water conservation. Wasteful water use causes great problems. Excessive runoff in upper reaches of the Syrdarya river, lands falling out of crop rotation, soil salinization, etc. have negative effect on regional economic conditions. All people must have equal access to water irrespective of geographical location (lower, middle, and upper reaches of the Syrdarya river). It is necessary to improve CDS and other water infrastructure. In view of forthcoming transfer to water pricing in Uzbekistan, each farmer have to practice water saving. We should disseminate everywhere economical irrigation technologies, such as:

- drip irrigation;
- alternate furrow irrigation;
- re-use of collector-drainage water;
- multi-tier irrigation.

We can achieve higher yields in case of wise water use and appropriate agro-engineering measures.

2. Wide application of field passports will provide farmers with information on soil structure, topography (irregularities of a field, i.e. water is accumulated in low places, while high places are dry), how to apply water, how to control salinity (leaching only of saline spots), appropriate application of fertilizers depending on soil structure, how to control pests and weeds.

Field passport indicates potential crop yields. Knowledge of field characteristics allows farmer to perform operations according to crop cultivation flow sheet.

Researchers can help farmers in developing passports on their requests and if the demand is increased, the cost will be decreased.

3. How to be prepared to climate change in our region? Available global climate change models show that the temperature will increase, while water resources will be reduced by

2-6 %. We need to adapt to these conditions and adequately select crop growing technologies. Thus, experience in growing water melon under film has shown that in the future, under climate change, seeding and ripening dates will shift. It is supposed that the growing season will become longer and make it possible to seed catch crops. Experience shows that yields of maize grown under film are higher than that achieved in open soil. However, maize is not advisable as a catch crop since it makes the soil depleted, in terms of nutrient content. It is recommended to plant green gram and common bean as catch crops that do not affect soil fertility and even improve the latter.

4. Experience in the use of film for growing crops showed good results. We need to disseminate such experience at larger scale. The use of film decreases evaporation resulting also in water saving and increases crop yields. Cotton yield amounted to 54 centner/ha in the soil covered with film against 27 centner/ha in the open soil in Tashlak rayon.

It is necessary to propagandize everywhere the advanced methods of using the film as mulch. Use of film is very profitable taking into account that 1 kg of film costs 1100 soums (1,1 \$US).

5. Farmers do not have problems with buying fertilizers. There is sufficient supply of fertilizers. Farmers need to apply them correctly. Developed field passports will include information on amounts of fertilizers to be applied and patterns of application.

6. The correct estimation of site quality-class is very important for farmers' fields. SANIIRI's researchers should help in this regard. They should estimate correctly the site quality-class for particular field and give formal conclusion. Then Giprozem may formally change the site quality-class based on that conclusion.

7. The following was identified regarding regional gender issues. In agriculture women are widely involved in crop growing as backup member. The main role is played by men. Woman-farmers are rare. In exceptional cases (death of husband) a woman begins to control production. In other cases, woman, along with housekeeping, have to deal with field works. However, there are no woman-waterers. This is the domain of men. Husband command money in the family and wife holds advising position. Woman is responsible for upbringing of children. Practices show that girls are slightly better in school education. Sometimes, they continue education in nearest city (Ferghana).

## **COORDINATION OF PREPARATION ACTIVITIES ON STRATEGIC PLANNING OF IWRM IMPLEMENTATION IN CENTRAL ASIA**

On 26-28 April 2004 a workshop on preparation to strategic planning of IWRM implementation in Central Asia was held in ICWC Training Center, Tashkent in form of round-table discussion. The round-table discussion was a follow-up of a set of events (workshop in Cholpon-Ata in August, 2002; meeting in Tashkent, November 2003; final meeting under IWRM-Ferghana Project in Ferghana, 2004; work meeting in Bishkek in February 2004) on elaboration of coordinated among all Central Asian republics policy and realization of IWRM strategic planning in the region.

The organizers of the workshop were UN ESCAP and SIC ICWC of Central Asia.

The workshop objectives and discussed questions were as follows:

1. Analysis of presented national reports and drafting of work plan for the final project stage on strategic planning and sustainable water management in Central Asia.
2. Discussion of concrete actions plan for the pilot project «Integrated Water Management in the lower reaches of Amudarya and Syrdarya» initiated and supported by the US State Department.

The round-table was represented by managers, key specialists of ICWC executive agencies and water organizations from CAR, partners of UN ESCAP project and IWRM-Ferghana project, US Embassy representatives and other concerned parties:

UN ESCAP: Ti Le-Huu (project manager); US Embassy in Uzbekistan: R.Watts, A.Reimov; US State Department: V.Horinkova; SDC: J.Gelly; BWO «Amudarya»: Yu.Khudaibergenov; BWO «Syrdarya»: N.Rakhmatov; SIC ICWC: Prof. V.Dukhovny (director), V.Sokolov, Yu.Rysbekov, A.Sorokin, M.Horst, V.Prihod'ko, I.Ruziyev, T.Palvanov, M.Pinkhasov, Sh.Mukhamedjanov, A.Tuchin;

National project teams: Kazakhstan: prof.N.Kipshakbayev, Ye.Moldybayev, A.Zhaksylykov, V.Bensman, N.Musirali; Kyrgyzstan: K.Beishekeyev, A.Djaloobayev; Tajikistan: S.Shaimardanov, Kh.Khodjiyev; Uzbekistan: U.Azimov, Kh.Ishanov, Kh.Gapparov, Prof. Ye.Kurbanbayev, M.Sabirov.

For reasons beyond our control, representatives of Turkmenistan could not take part in the workshop.

**1.** Since 2000, UN ESCAP has been implementing project on Capacity Building in the field of natural resources strategic planning and management in Asia and the Pacific. In August 2002, within the framework of this project, SIC ICWC organized activities under the Project «Strategic planning and sustainable management of water development in Central Asia» (SPM). The objective of SPM is to implement IWRM in order to achieve sustainable functioning of water sector. This is required to identify priority directions and to fulfill the first-priority and long-term tasks of socio-economic development in CAR.

In this context, initially approbation of IWRM principles within the framework of SPM project is possible at pilot system level, with development of recommendations on step-wise extension to water sector as a whole and to other economic sectors in the future.

SIC ICWC director, Prof. V.Dukhovny opened the workshop.

In his opening speech, Prof. V.Dukhovny highlighted the key issues of water management in Central Asia, stressed a need for systems approach and concerted action to resolve the issues, and stated the place and role of strategic planning and sustainable water management in long-term development plans of Central Asian republics.

Water sector in CAR, being a vital for society, must perform, on sustainable basis, the following goal functions («mission»):

- ensure economic and social water demand at regional, national and local levels on the basis of equal access to water in required quantity and quality;
- ensure preservation of natural pieces as landscape elements and native habitat, flora and fauna having certain water demand both in terms of quantity and quality;
- prevent and eliminate damage from natural and man-caused water-related disasters;
- organize relevant research in order to enhance performance of the above-mentioned functions and forecast environmental and water conditions in the future.

The ultimate aim of sustainable development, that is to improve the common weal and private welfare without damaging environment and infringing upon future generation's interests, cannot be achieved without strategic planning of regional water management. Thereafter, the national reports on SPM should be oriented towards the achievement of sustainable development goals in each country with due account for regional interests.

In his opening speech Mr. Ti Le-Huu (UN ESCAP) dwelt on strengths and weaknesses of Central Asian water sector. He noted particularly that the region has one of the most developed irrigation infrastructure in the world, the huge experience in operating irrigation and drainage systems, the high-qualified water professionals and that the high-level politicians in CAR are interested in intensification of market reforms. This may form a firm basis for implementation of SPM in the region.

At the same time, different conditions and levels of socio-economic development and weak economies in the republics, small internal and external investments in water sector under high capital intensity and a range of other negative factors (which were nicely called by speaker as «opportunities»), to a great extent, are an obstacle to sustainable development in Central Asia. We need to identify and analyze those and other destabilizing factors in order to achieve stable economic growth in the region.

The US State Department's regional councilor on environment Mr. R. Watts in his speech stressed that the US Government positively appreciated the pilot implementation of IWRM in the Ferghana Valley and supported the idea to disseminate this experience among other areas in Central Asia. The US State Department has limited financing for development projects and, therefore, is guided by project significance from strategic view but not by the size of projects. In this context, allocation of funds by the US State Department for preparatory work on implementation of IWRM in the lower reaches of Amudarya and Syrdarya within the framework of a pilot project is of particular importance. In case of successful implementation, the State Department will assist in searching funds for extension of activities.

Next, national reports were presented by:

The Republic of Kazakhstan – Director of SIC ICWC Kazakh branch Prof. N. Kipshakbayev; the Kyrgyz Republic – First Deputy Director of Water Resources Department K. Beishekeyev, Director of SIC ICWC Kyrgyz branch A. Djailoobayev; the Republic of Tajikistan – Chief of Sogd oblast water management organization Kh. Khodjiyev, Director of SIC ICWC Tajik branch S. Shaimordonov; the Republic of Uzbekistan – Deputy Chief of Central water management department at MAWR Kh. Ishanov, chief of department at MAWR U. Azimov.

Discussion on national report revealed strengths and weaknesses of the reports and proposals of the national work groups (NWG) on preparation of SPM in the Aral Sea basin. Final estimation of the national reports in view of how they met the established requirements was made by V. Dukhovny («severe») and Ti Le-Huu («more gentle»).

Among common shortcomings were low performance discipline and delays in fulfillment of given task. Thus, only Tajikistan's NWG has submitted draft report in time (January, 2004). Corrected reports were submitted by the national groups of Kazakhstan and Tajikistan, while Kyrgyzstan, Turkmenistan, and Uzbekistan submitted them with delays.

Final report should have been drafted by 1 April; however, for personal reasons this has

not been done. Thus, despite clear task setting in national ToRs and additionally distributed questionnaires and explanations, a number of items in the reports were poorly stated, while Kyrgyz report in essence was not admissible at all. Uzbek report was thoroughly revised by the regional group under Prof. V. Dukhovny leadership and currently is close to quality of Kazakh report by main criteria.

The comparative analysis of the national reports according to their contents (using four-point system suggested by Mr. Ti Le-Huu as: «good», «fair», «poor», «not clear») is given below:

*1. IWRM concept:*

general understanding, technical, legal, and institutional aspects, operational framework and experience: all reports - «good»;

general socio-economic set-up: Uzbekistan – «good», Kazakhstan and Tajikistan – «fair», Kyrgyzstan and Turkmenistan - «poor».

*2. Vision of SPM implementation at national level:*

- development prospects and scenarios: all reports - «good», except for Kyrgyzstan – «fair»;

- water resources in national vision: Uzbekistan - «good», Kazakhstan and Tajikistan - «fair», Kyrgyzstan and Turkmenistan - «poor»;

- link of the national vision with the Aral Sea basin: all reports – «poor».

*3. Vision of SPM implementation in pilot objects:*

- technical aspects of water use: Kazakhstan, Turkmenistan, Uzbekistan – «good», Tajikistan – «fair», Kyrgyzstan – «not clear»;

- socio-economic objectives and monitoring: all reports – «poor»;

- vision of pilot objects, leading players' mission statement, link with the national vision and scenarios: all reports – «not clear».

More detailed analysis of the national reports made by SIC ICWC has shown the following picture, that is how the report content met established requirements:

*1. A number of important elements of SPM IWRM* (existing water management system, program of its improvement and priorities, current internal and external problems, role of irrigated agriculture in national socio-economic development, a need to apply hydrographic approach to water management, importance of WUA and WUU) were addressed quite in full.

*2. A number of other indicators* (particular problems of IWRM implementation, SWOT analysis, provision of pilot objects and systems with equipment, ways to reduce sectoral and resource fragmentation, specific character and return from implementation of IWRM in particular zone, probable obstacles for implementation of IWRM at national level, principles of shifting to hydroecological natural resource management, technical aspects of wide IWRM implementation, specific actions in pilot zone, strategic objectives for avoiding crisis in the future: ecology, social orientation and public participation, creation of enabling political environment, water sector sustainability) were not addressed or set forth very poor in all national report.

*3. As to other items*, contents of reports varied widely. Thus, coordination of IWRM implementation with local governments was addressed only in Kazakh national report; manpower policy and publicity of IWRM experience were addressed in the national reports of

Kazakhstan and Turkmenistan; water conservation issue were touched upon in Tajik report, etc.

The participants agreed that practically all national reports poorly illustrated or do not address at all the following important aspects of SPM:

- understanding, on the whole, of the key elements and strategic objectives of SPM;
- understanding of destabilizing factors on the way to development and implementation of IWRM (particularly in national reports of Kyrgyzstan and Turkmenistan.);
- measures to develop the interstate integration (national reports describe the latter only in light of shortcomings but not of opportunities);
- suggestions on the use of all development potentials – production, natural, social, financial, human – from systems approach viewpoint;
- analysis and linkage of various national development scenarios (options) with the regional development interests;
- history analysis of water sector development by stages (1970s, 1980s, 1990s) from viewpoint of water management system efficiency;
- guidance by priorities in order to eliminate the causes rather than the effects of problem and by cost-effective methods of problem resolution;
- analysis of IWRM experience in the Ferghana Valley (national reports of Kyrgyzstan, Tajikistan, and Uzbekistan that are involved the project) in order to disseminate it;
- system analysis of internal and external factors of SPM and their relationships;
- issues of both intersectoral and interresource integration;
- wider public involvement.

The evaluation lists were disseminated among NWGs for revision of the reports. Reports of Kazakhstan, Uzbekistan, and Tajikistan need to be substantially revised, while the reports of Turkmenistan and Kyrgyzstan need major revision. Deadline for submission of the revised reports is **22.05.2004**.

It was stressed that the national reports should give as a result the strategic plan for implementation of IWRM according to ESCAP approved scheme:

1. *Introduction:* development scenarios; sector's problems; approaches to resolution of these problems.
2. *The key national elements of SPM:* the national development goals; opportunities and threats on the way of IWRM implementation; legal and institutional frameworks; ways of IWRM implementation, monitoring and evaluation of implementation; SPM goals: a) potential of sustainable national and regional development under conditions of water shortage and in light of destabilizing factors; b) creation of necessary conditions to preserve and enhance the natural capacity.
3. *Adapting national development goals to regional limitations.*
4. *Interstate consultation mechanism.*
5. *Conclusions and recommendations.*

Discussion on the first point was finished with training on how to identify:

- first-priority national goals and pilot research areas to be supported or established so that to achieve those goals;
- priority issues related to SPM and priority indicators to keep track of IWRMM implementations and progress;



- national Vision and expectations from implementation of the pilot project;
- key factors and driving forces that may impact the output from viewpoint of Vision realization and the expectations.

More frequently addressed *priority objectives and challenges* included: environmental and socio-economic problems; better equipment of hydrological and land reclamation services; ensure water rights for all categories of water users, including natural ecosystems; ensure involvement of stakeholders in IWRM; *key factors* – personnel, political and legal framework, financial provision of IWRM.

2. Prof. V.Dukhovny, V.Horinkova (The US State Department, project consultant), M.Horst (regional project coordinator), V.Sokolov (regional coordinator, IWRM-Ferghana project), Prof. N.Kipshakbayev (Kazakh NWG), Prof. Kurbanbayev, Kh.Gapparov (Uzbek NWG) and others spoke on the second item (discussion on action plan for starting-up pilot project «IWRM in the lower reaches of Amudarya and Syrdarya»).

The long-term project objective is to enhance cooperation between Central Asian countries in the field of transboundary water use through development of proposals on shift to IWRM in the lower reaches of Amudarya and Syrdarya. Shift to IWRM will be implemented in the pilot objects to be selected in Kazakhstan (Kzyl-Orda oblast), Turkmenistan (Dashgovuz oblast), and Uzbekistan (Katakalkpakstan and Khorezm oblast). The project resulted from a need to extend two-year experience of IWRM implementation in the Ferghana Valley (under SDC support). Preliminary investigation of the pilot zones and justification of the selection are medium objectives.

The lower reaches of Amudarya and Syrdarya are the socially tense zones characterized by the following:

- complex natural and climatic conditions;
- abundance of land resources (excluding Khorezm) under acute water shortage;
- worse quality of irrigation water and, consequently, of irrigated lands as compared to upper reaches;
- these areas suffered most of all from un-equal flow distribution between the zones of flow formation and the zones of flow dispersion;
- infringement of water users' interests regarding provision with approved water limits caused by shortcomings of water management in general and by water distribution in particular;
- low GNP per capita as compared to that of other zones in the region;
- complicated interrelated problems: environmental (natural disaster zone), socio-economic, and transboundary.

As a result of proposals presented by the representatives of national groups (proposals of Turkmen NWG were presented by Prof. V.Dukhovny) and the exchange of opinions on implementation of the project, the following was concluded:

- consider specific characteristics of the pilot zones as mentioned above;
- use, as much as possible, the positive experience and lessons learnt from IWRM-Ferghana project;
- particular attention should be paid to control over the process of water distribution in order to ensure equitable and equal water supply to water users and especially to ecosystems;

at given stage, reach an understanding that IWRM does not consist in water management along the hydrographic boundaries but the latter is only one of institutional aspects of IWRM;

utilization of additional water sources for irrigation – groundwater, return water, collector-drainage water – as natural resources;

approbation of IWRM principles in pilot objects of the lower reaches should be oriented towards follow-up application of IWRM at a level of oblast, country and the region as a whole.

With implementation of this project, the process of involvement of all Central Asian countries in approbation of IWRM 6 principles in pilot objects will be completed.

Consideration of those two items (projects «IWRM in the lower reaches of Amudarya and Syrdarya» and SPM IWRM in CAR) on the agenda of one workshop was a positive moment since problems related to implementation of those problems were considered inter-dependently.

Finally, representatives of UN ESCAP (Mr. Ti Le-Huu) and the US State Department (Mr. R. Watts) assured the participants that they would do their best to attract finances for IWRM projects in Central Asia.

## **22 MARCH – INTERNATIONAL WATER DAY**

The Scientific-Information Center of ICWC held on 22 March in ICWC Training Center a scientific conference, dedicated to the World Water Day. The representatives of BVO “Syrdarya”, SPA SANIIRI, and SIC ICWC took part in the conference.

At the conference, ICID Vice President Prof. V.A. Dukhovny presented a report titled “Current water sector problems in Central Asia: tasks of science and practice”.

The report points out that “our heritage from the USSR was sufficiently varied. A powerful infrastructure that needs significant finances for the maintenance and continuous renewal, on the one hand. The system had large reserves, which enabled to keep the productivity and working capacity by now after 15 years. On the other hand, constructed basic assets were located very irregularly: highly capital-intensive ones in one zones, sufficiently primitive ones in other zones. As a result, in some zones there is an absolute unfitness of canal systems (e.g. in Karakalpakstan) or inefficiency of sprinkling systems (e.g. in Kazakhstan).

It is necessary to note knowledge, theoretical basis and practice; large scientific and practical foundation among the positive inheritance. Did we use it duly? I think no. We lost them for the most part. What is the reason? Inactivity and inertness of thinking, impossibility of discerning new conditions and blending with them; making new decisions based on the old knowledge; communistic disregard mixed with capitalistic boorishness, insolence and degeneration.

Before there was a single political system that included customary postulates and lines of behavior: they were right in one way and wrong in other one. These positions are as fol-

low:

- ignoring the requirements of nature;
- ignoring public opinion and participation;
- congestion of systems and lack of trust (on principle “I am a chief but you are a fool!”)
- lack of orientation to economic mechanism and self-repayment.

Now, all this heritage of the past has affected the water sector hundredfold, and has been aggravated by the presence of 5 (maybe 6) political lines, in which our water sector moves: diverse approaches, diverse priorities, and even diverse mentality.

All this has been reflected on the current state of the water sector.

Waters have become transboundary. Hydro egoism is developing. What will we oppose to it? Practically nothing. Negotiation process starting as it seemed successfully in 1992 and other measures have stopped – over 8 years no agreements have been signed at all!

We relied on the scheme as a dogma and were so ambitious, and finally by the 13<sup>th</sup> year of independence became more dependent and unsustainable than in 1992. But again the matter is the inertness of thinking and inability to take into account that it is impossible to live, as before, it is necessary to seek new ways to reach consensus and common interests.

In this regard ICWC has changed into a club of water officials that has a weak impact on governments as well as them, and is most likely to put a good face on things. Meanwhile, our neighbors and ICWC members have showed that a lot can be done by this way: Kazakhstan-China, Kazakhstan-Russia, Kazakhstan-Kyrgyzstan on Chui, Turkmenistan-Iran on Tejen. But we cannot begin and develop the negotiation process, playing some games.

But God does not forgive anyone for anything, especially in regard to water. Today someone is the winner, but tomorrow he will be the loser. Both high and low water years teach us but we shut our eyes and feign that nothing is going on. The last ICWC meeting gave some hopes for the progress if only the efforts would not be lost.

But much depends on us:

Clear and sound decisions and proposals are needed;

It is necessary to work not for maintaining own pocket interests but for common affair;

We should turn into responsible people;

It needs to become necessary for affair, not for paper!

We should unite by all available instruments (training, discussions, joint action, exchange of ideas and so on)!!!

One of such ideas is integrated water resources management (IWRM). In whole, I am satisfied with our work in this direction: not so much the results, as our overall penetration into the core of processes and their difference in our countries. They help to understand how far we are from the reality and what we can do for this reality by our scanty strength. Above all, it is necessary to merge with the requirements and concerns of water user, understand them, and prepare our common approaches. In this regard we have moved ahead. We are standing on the way to a quite new understanding and generalization of IWRM. And I am glad that our youth is advancing well in understanding the main IWRM instruments – consultation service, water management, public participation, use of modeling, water use plans, and development of a clear mechanism”.

## **5<sup>TH</sup> REGIONAL FORUM ON NATURE CONSERVATION AND EFFICIENT NATURE MANAGEMENT**

On 5-7 April 2004 in Amman, Jordan the 5<sup>th</sup> Regional Forum on Nature Conservation and Efficient Nature Management was held, in which the delegation from Uzbekistan took part.

Mr. A. Steiner, Director General of the International Union for the Conservation of Nature (IUCN), welcomed the forum participants.

Then the sessions in four sections began:

Support of the productivity and diversity of freshwater ecosystems.

Water for human and world well being.

Prospects of saving fresh water biodiversity.

Role of the trade in saving biodiversity.

SIC ICWC specialist I. Ruziyev presented in Group C a paper on the Aral Sea problems. After a long discussion on the paper, it was decided to extend and publish the paper in IUCN WESCANA Bulletin.

The next day the regional projects of the work program for 2005-2008 and general draft work plan for IUCN WESCANA for 2005-2008 were presented.

The 3<sup>rd</sup> IUCN World Congress will be held on 17-25 November 2004 in Bangkok.

## A NEW ORGANIZATION HAS APPEARED

The Arab Water Council (AWC) was officially founded on 14 April 2004 in Cairo after many years of planning, discussions and consultations. This public nonprofit, regional organization was created to solve water problems in the Arab countries.

The Mission of the Council is to promote better understanding and management of water resources in the Arab countries by inter-disciplinary, nonpolitical, professional and scientific methods; disseminate knowledge; and exchange experience and information for rational and comprehensive water resources development in the region for the benefit of the whole of its population.

The main purposes of the Council are:

- to impact on decision-making, formulating a policy and a strategic orientation for improving water resources management in the region;
- to present regional views at international and global forums, transmit knowledge, conceptually develop the policy, strategy and action plans regarding water resources and their use;
- to second rational use and management of water resources to provide effective, operative and equitable water use and technologies in the interests of all the inhabitants of the region;
- to consult the public and private sectors in planning, designing, operating and maintaining water systems at regional, national and local levels;
- to provide adequate participation of the concerned groups in the decision-making and equitably allocate benefits from water resources development.

The Constituent Assembly gathered in Cairo and included 400 experts, scientists, and water professionals from 17 Arab countries. The Assembly participants were the governments, public organizations, universities, research centers, NGOs, development funds and international financial institutes, UN organizations and so on.

The Assembly also included the former Prime Minister of Sudan and ministers from Malaysia, Iraq, Jordan, Sudan, Egypt as well as high-ranking officials from Morocco, Algeria, Tunisia, Libya, Lebanon, Palestine, Saudi Arabia, Bahrain, Yemen, the United Arab Emirates, League of the Arab States, Arab Organization for Agricultural Development, CEDARE, Arab Council for Economic Integration, CIHEAM-BARI, UN-ESCWA, UNEP UNESCO, UNU-INWEH, World Bank and Saudi Fund for the Development.

The Constituent Assembly elected Dr. Mahmoud Abu-Zeid as a President of the Council and asked him to head the Constituent Committee, founded to complete organizational structure, formulate statutes, extend the membership and prepare the First General Assembly. The Provisional Secretary is based in Cairo.

“Arab Water Council defines new concept of civil society and its role in water sector of the Arab countries”, said Mahmoud Abu-Zeid. “Today the Arab countries are faced with the most important challenges in the world. These challenges are identified by internal and external factors, influencing water and food security, threatening ecological, economic and social stability and hampering the development of stable and secure region,” – said in conclusion Dr. Abu-Zeid.

The Arab world includes 22 countries of Africa and Western Asia, located mainly in arid and semiarid zones. The population of these countries amount to 300 million, occupying an area of 113 million km<sup>2</sup>. More than 65% of renewable water resources come from outside the region through common rivers and aquifers. These countries have minimum freshwater resources per capita (about 1000 m<sup>3</sup>/year). In most countries this figure is even lower. Many countries depend on artificial water desalination for drinking purposes due to the lack of natural freshwater resources. Water deficit makes the region unable to feed itself and dependent on other countries, breaking food security of the countries in the region. A gap between food security and real food production is increasing, forcing to spend more and more foreign currency on food import. About 20% of the population don't have access to safe water and 35% to adequate sanitation conditions in spite of concentrated state investments in the sector.

Some members of the Arab Water Council participated in the Constituent Assembly headed by the Dr. Abu-Zeid: Mona El-Qadi – Manager, Mohtar Bzoui – Treasurer, Ismail Najjar – Deputy Manager and Former Treasurer, Atef Hamdi – Manager, Muhammed Taufik – Deputy Manager, Ali Shady – Manager and Co-founder of WWC.

For further information please contact: [secretariat@arabwatercouncil.org](mailto:secretariat@arabwatercouncil.org).

## NEW TECHNOLOGIES FOR PRODUCING FERTILIZERS THROUGH ORGANIC RAW MATERIAL BIOCONVERSION IN AGROINDUSTRIAL ENTERPRISES

Hundred millions of tons of organic raw materials (dung, straw, sawdust, etc.) annually form in the country in the enterprises of the agro industrial and other sectors, and used as agricultural fertilizers only partially, after appropriate processing. The most part of these raw materials is accumulated for years near cattle-breeding and poultry farms, wood-working enterprises and others that leads to the deterioration of its qualitative composition and sharpening of environmental protection the problem, especially in zones of developed cattle breeding and poultry farming.

Organic raw materials of enterprises of the agro industrial sector, woodworking and pulp-and-paper industries are natural polymers renewable in photosynthesis process, containing valuable nutrients with high content of biogenic elements: nitrogen, phosphorus, potassium, carbon and so on, which can be transformed into biologically active fertilizers and forage components for agricultural animals and poultry using the methods of bioconversion (fermentation).

New resource-saving technologies of organic raw material bioconversion that enable to produce biologically active fertilizers and forage components for agricultural animals have been developed in All-Russian Research Institute for Agricultural Use of Reclaimed Lands. The technologies are based on solid-phase fermentation of diverse organic raw materials and management of this process. Technologies for obtaining fermentation product - multipurpose compost (MPC) - have been developed in two versions: accelerated – in special biofermenter chambers and in open sites for composting.

The length of organic raw material fermentation depends mainly on how steadfast the parameters controlled during the fermentation process are – temperature and content of oxygen in biomass, and can be from 6-7 days in biofermenter chambers up to 36 days in open sites.

Biofermenter is a structure of 5x10 m (50 m<sup>2</sup>) in size and up to 4.5 m in height, which can be made of brick, reinforced concrete and other materials. Two-chamber biofermenter of (5x10)x2x4.5 m in size is a standard (single) facility for the production of MPC. Depending on the volumes of biofertilizer production, batteries of any number of biofermenters can be used in practice. Principal scheme of biofermenter is presented in the figure.

Ecologically clean organic fertilizer production in open sites is carried out in the following way: organic mixture is placed in clamps in the site with a solid covering for biothermal treatment at a temperature of 50 - 65°C with periodic aeration in 8-12 days. Principal process flow diagram is presented in the figure.

The main advantages of the new technologies (in comparison with the conventional compost preparation technologies):



management of biofermentation process to obtain end products with given properties;

significant reduction of energy consumption (2-3 times);

lack of odor nuisance, decontamination of primary raw material from pathogens, eggs and larvae of helminthes, and extermination of weed seed germination.

During the production of such fertilizers as a carbonic component, along with peat, organic raw material that is usually not involved in organic fertilizer production or used in a limited way (sawdust, wastes from flax processing and so on) can be used.

The product of organic raw material bioconversion, a multipurpose compost (MPC), is a dark brown homogeneous dry (moisture 55-70%) loose mass with neutral or alkaline reaction (pH 6.3-7.2) and high content of nutrients ready for plants (mass percentage for absolutely dry substance: total nitrogen – 2.5-2.6; phosphorus (P<sub>2</sub>O<sub>5</sub>) – 2.0-2.2; potassium (K<sub>2</sub>O) – 1.5-1.7).

Selecting appropriate components of initial mixture, putting such natural components as phosphorus flour and potash salt into the mixture being fermented in doses respectively up to 2 and 1% of mixture mass enable to obtain

end product with increased gross content of nutritious elements: nitrogen (N<sub>total</sub>) – 2.8-3.0; phosphorus (P<sub>2</sub>O<sub>5</sub>) – 3.0-3.5; potassium (K<sub>2</sub>O) – 2.4-2.8% of absolutely dry mass.

The team of the scientists from the All-Russian Research Institute for Agricultural Use of Reclaimed Lands guided by Director of the Institute, member of the Russian Academy of Agricultural Sciences N.G. Kovalev was awarded the Russian Federation governmental prize in science and technology for work “Scientific principles and new technologies for organic raw material bioconversion in agro industrial enterprises”.



## INFORMATION ON INTERNATIONAL CONFERENCES AND COURSES

### 3<sup>rd</sup> International Conference on Water Resources Management

(11-13 April 2005, Algarva, Portugal)

<http://www.wessex.ac.uk/conference/2005/waterresources2005/cfp.html>

The Third International Conference on Water Resources Management will present the latest technological and scientific developments, related to surface and groundwater management.

There is not a need to emphasize the importance of this meeting too much, as water is getting more valuable resource, on which the well being of future generations depends. The problems of water resources quality, quantity, management and planning and related subjects are essential for the world population in the future.

The water conferences organized by the Wessex Technological Institute were held throughout the world in the recent 25 years, as a result of the wish of the international community counterparts to participate in knowledge sharing in the course of these meetings. Water resources management is one of the most important conferences in a number of similar conferences.

The meeting is aimed at bringing together engineers, scientists and other professionals from many countries, involved in research and development of a wide range of subjects related to water resources and management.

#### *Conference themes*

- Water resources management and planning
- Wastewater treatment and management
- Municipal water management
- Water quality
- Pollution control
- Irrigation problems
- Water bodies and lakes
- River basin management
- Hydrologic modeling
- Flood risk
- Decision support systems

The papers on the themes given above and other ones falling into the range of the meeting are welcomed. The abstracts of no more than 300 words should be sent by ordinary mail, e-mail, fax or through our web-site.

We are pleased to support abstract submission in an electron form.

Please fill in the Form for Abstract Submission in our web-site at:  
[\*\*http://www.wessex.ac.uk/conference/2005/waterresources2005/cfp.html\*\*](http://www.wessex.ac.uk/conference/2005/waterresources2005/cfp.html)

Or send us your abstract by e-mail to the Conference Secretariat at:

***adarcy-burt@wessex.ac.uk***. Insert ***WRM 2005*** into the line where the theme should be indicated, and include your name, full address and conference theme in the main contents of your message.

For further information on paper submission please contact at:

***[http://www.witpress.com/author\\_instruction.html](http://www.witpress.com/author_instruction.html)***

Send your abstracts without delay. The deadline for paper submission will be recommended during the receipt of your abstract.

The conference papers will be published by WIT Press in the form of a book with a hard cover, and be available for delegates during the registration. Moreover, the proceedings will be widely disseminated after the conference through international book trade and direct notification of readers and librarians. All the papers will be constantly archived in the Wessex Institute News in the Internet site of our Library, which is available for the International Scientific Society.

The cover of the WIT papers regularly appears among publications, including Applied Mechanics Reviews (AMR); respective articles from Elsevier Engineering Information Inc.; INSPEC (IEE); Mathematical Reviews; Scitech Book News; ISI's Index to Proceedings and Cambridge Scientific Abstracts. The papers are also listed in the Directory of published papers.

The previous papers and other corresponding literature of water conferences have been accessible thanks to WIT Press. See "Progress in Water Resources Book Series" at: ***<http://www.witpress.com/series/waterseries.html>***

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***<http://www.wessex.ac.uk/conferences/2005/waterresources2005/cfp.html>***

Please communicate this information to the interested persons. They can join us, sending a message through e-mail at [enquiries@wessex.ac.uk](mailto:enquiries@wessex.ac.uk) and entering SUBSCRIBE-WRM 05 as a theme.

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### **International Water Management Courses**

Annual International Water Management Courses (IWMC), organized by the Swiss Federal Institute of Environmental Sciences and Technology (EAWAG) and Swiss Re, will be carried out from 28 September to 1 October 2004 in Ruschlikon, Switzerland.

In 2004, special emphasis will be put on “River Water Management”.

Applications for participation are accepted up to 30 April 2004.

Detailed information is available at [www.iwmc.ch](http://www.iwmc.ch)

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