Interstate Coordination Water Commission of Central Asia

BULLETIN No. 16

April 1998

CONTENTS

DECISION OF THE BOARD OF INTERNATIONAL FUND FOR ARAL SEA SAVING

1. About IFAS and its branches activity since May 1997.

March 12, 1998 Tashkent

1.1. To accept information about IFAS and its branches activity since May 1997.

1.2. To entrust EC IFAS (mr. Giniyatullin):

Jointly with leadership of the EC IFAS branches to strengthen activity on financial means attraction from countries-donors, international organizations, different funds and local organisations-donors to the IFAS for the Aral sea basin's projects financing and creation in the region's countries, if necessary, agencies-foundations for social assistance to population.

To continue common work with WB, UNDP and EU on implementation of GEF and WARMAP projects.

For the Republic of Kazakhstan
For the Kyrgiz Republic
For the Republic of Tadjikistan
For Turkmenistan
For the Republic of Uzbekistan

DECISION OF THE BOARD OF INTERNATIONAL FUND FOR ARAL SEA SAVING

2. About implementation of the "Programme of concrete actions" in 1997 on expense of the states of Central Asia and forecast for 1998 with the priority to the population potable water supply.

March 12, 1998 Tashkent

1. To accept information about implementation of the "Programme of concrete actions" in 1997 on expense of the states of Central Asia and forecast for 1998 with priority to the population potable water supply.

2. To draw attention of health, nature protection and water-related entities of the states of Central Asia to aggravation of sanitary-epidemiologic situation in the Aral sea basin.

EC IFAS to submit information about sanitary-epidemiologic situation to the governments of the states of Central Asia.

For the Republic of Kazakhstan
For the Kyrgiz Republic
For the Republic of Tadjikistan
For Turkmenistan
For the Republic of Uzbekistan

REFERENCE ABOUT IMPLEMENTATION OF THE "PROGRAMME OF CONCRETE ACTIONS" BY THE STATES OF CENTRAL ASIA ON THEIR OWN EXPENCE

In spite of certain economic difficulties bounded with transition to market-oriented economy the governments of Central Asia gradually implement the programme of measures on ecological recovery of the Aral sea crisis zone and improvement of population living standards. Target financing of projects providing population social protection and ecological situation improvement is foreseen in the framework of national investment programmes.

In order to provide these projects implementation some governmental decisions are made addressed to Aral sea adjacent areas situation improvement, population social protection, sanitary-epidemiologic and social-economic situation improvement, population potable water provision, rural settlements provision with natural gas, irrigated lands reclamation state support, rational use of water resources.

Since 1994 by the states of Central Asia for these goals USD 3753.5 mln were spent from different sources of financing. Measures undertaken allowed to improve, to some extent, population living standards.

Within the period of 1994-1997 in the Aral Sea adjacent zone hospitals for 4320 beds were built, 3215 km of water supply pipeline and 7448.8 km of gas conveyance pipeline were constructed.

In 1997 the states of Central Asia for the programme implementation spent USD 1067.5 mln. More details are given in the table attached.

In each state according to the elaborated priorities certain measures related to the Aral Sea problem have been undertaken and, for the first part, population provision with clean potable water.

In the Republic of Kazakhstan within the framework of the Project "Clean water and health" feasibility study is completed. The project is funded by Kuwait Fund of Arab Economic Development (KFAED). By 05.01.98 995.5 th. USD from 1.171,2 th USD foreseen were spent.

Simultaneously the pilot project implementation for water supply of the settlements of the Aralsk and Kazalinsk districts of Kzylorda province is started on expense of WB loan in amount of USD 7 mln. Government of Germany allocated DM 7 mln. for water treatment installation construction. Kuwait fund intends to allocate USD 24 mln.

In the Kyrgiz Republic drinking water supply is also a critical area. National programme "Drinking water" (1997-2015) is developed, which needs USD 170 mln. At present time negotiations with the World Bank about the loan for this programme implementation are under progress. From the government side 252 mln. soms are allocated.

In the Republic of Tadjikistan special attention is devoted to upper watersheds recovery and regional unified hydrometeorological data base and water resources accounting system creation.

Besides, projects in potable water supply, energetics development, irrigated land development and highway construction are being implemented.

By the end of 1993 agreement with Islamic Development Bank was achieved about USD 280 th. grant allocation for feasibility study on highway Horog-Kairakkum construction. The same bank has taken obligation to provide equipment for cardiologic center in Dushanbe. Credit leaving for Karategin zone rehabilitation and reconstruction in amount of

USD 20 mln. including: for social provision - USD 10 mln. and for highways and schools rehabilitation - USD 10 mln. is under negotiation.

In Turkmenistan paying special attention to drinking water supply special Committee is established by Decree of President. It is planned to improve water supply and sewerage systems operation for 100 th. people in Tashauz province. In 1997 agreement between the government and the World Bank was signed about USD 30.3 mln. loan giving with its return during 20 years. Government allocated for this project USD 2.6 mln.

Treatment facilities, main and distributive pipelines are started to be constructed with assistance of iranian specialists to provide Mary province population with drinking water.

In the Republic of Uzbekistan they started with project "Clean water, sanitary and health" implementation which foresees drinking water supply and sanitary conditions improvement.

For this purpose USD 117 mln. are allocated including USD 13 mln. as the Government contribution, USD 75 mln. as the World Bank credit, USD 20 mln - as the Kuwait Fund credit, USD 9 mln. as the Deutsh Bank credit. In 1997 USD 5.2 mln. were spent.

"PROGRAMME OF CONCRETE ACTIONS" IMPLEMENTATION BY THE STATES OF CENTRAL ASIA ON THEIR OWN EXPENSE IN 1997.

Country	Unit	1997		1998 (forecast)
		plan	Fact USD	
Kazakhstan	mln. tenge	125	25250	135
Kyrgizstan	th.som		217381	3950000.0
Tadjikistan	mln. ruble	25700	35000	13000
Turkmenistan	mln. manat	34245,0	5000	
Uzbekistan	mln. soum	55000	7856000	-

This financing provided construction of the following objects

Objects	Unit	Country				
		Kazakhstan	Kyrgizstan	Tadjikistan	Turkmenistan	Uzbekistan
Hospitals	bed		275	50		332
Clinics	visit			700		
Water supply pipelines	km	42,1		20,65	22,5	606
Sewerage	km	1,5				
Gas supply system	km			11,8		1160
Collector-drainage network	km			1,34	48.1	358

DECISION OF THE BOARD OF INTERNATIONAL FUND FOR ARAL SEA SAVING

3. About provision of contributions by the countries participants to IFAS and the measures on involvement of the Agencies-foundations in social assistance to population.

March, 12, 1998 Tashkent

3.1. It should be noted that since February 28, 1997 attention was strengthened to current contributions of the states- participants of IFAS and their debts to IFAS extinguishing, certain activity is undertaken to attract different international organizations and foundations for the Aral Sea basin is ecological and social economic situation improvement.

3.2. For 1998 it is foreseen to contribute to IFAS by the Republic of Kazakhstan - 574.875 mln. tenge, by the Republic of Tadjikistan - 108.78 mln. tadjik roubles, by Turkmenistan 3.600 mln. manat, by the Republic of Uzbekistan - 1.192 mln. soums.

3.3. Financial entities of the states-participants should provide fulfillment of IFAS Board decision of September 11, 1997 in Tashkent on the debts extinguishing for 1995-1997 according to the Head of states decision of February 28, 1997, transference of current contributions should be done since 1998 in dollar equivalent.

3.4. It should be noted, that IFAS branches established in all Central Asian states practically do not function. Current contributions were not made by the Kyrgiz Republic during 1995-1997.

3.5. IFAS branches should elaborate the mechanism of Agencies-foundations involvement, strengthen activity on grants attraction from the countries-donors and international organizations for financing of prior projects.

For the Republic of Kazakhstan
For the Kyrgiz Republic
For the Republic of Tadjikistan
For Turkmenistan
For the Republic of Uzbekistan

DECISION OF THE BOARD OF INTERNATIONAL FUND FOR ARAL SEA SAVING

4. About IFAS Board plan of activity on 1998-1999 approval

March, 12, 1998 Tashkent

4.1. To approve the IFAS Board meetings schedule on given period.

4.2. Chairman of the IFAS Board mr. Giniyatullin should provide necessary materials preparation to the meetings.

For the Republic of Kazakhstan
For the Kyrgiz Republic
For the Republic of Tadjikistan
For Turkmenistan

For the Republic of Uzbekistan

DECISION OF THE BOARD OF INTERNATIONAL FUND FOR ARAL SEA SAVING

About main objectives and strategy directions of water resources rational use

March, 12, 1998 Tashkent

1. To approve main objectives and strategy directions of water resources rational use.
2. ICWC and CSD should concentrate their efforts on the water resources rational use.

For the Republic of Kazakhstan
For the Kyrgiz Republic
For the Republic of Tadjikistan
For Turkmenistan
For the Republic of Uzbekistan

MAIN OBJECTIVES AND STRATEGY DIRECTIONS OF WATER RESOURCES RATIONAL USE

1. General

1.1. As a basis of problem the "Programme of concrete actions on improving social-economic and ecological situation in the Aral Sea basin," "Main concept provisions for the Aral Sea, its adjacent areas and the basin with regard to region's development", approved by the heads of states of Central Asia on January 11. 1994, "Main provisions of the regional water strategy of the Aral Sea basin" and Nukus (1995) and Almaty (1996) declaration.

1.2. The Aral Sea basin Programme (ASBP) was born not only with regard to the Aral Sea desiccation, but because of environment degradation and related social-economic situation which adversely influences 45 mln. people.

The reasons are multiple and are not limited by past policy in water management and agriculture. ASBP was developed in 1994 in order to eliminate basic reasons of this problems linked with water resources management and restore sustainable and sound environment in the region.

1.3. This problem arises very important questions in the regional and national strategies development. These regions must obtain additional amount of water timely, necessary quality and quantity. ICWC allocates certain amount of water to the Aral Sea annually but the exact objectives were not defined and agreed by the states of the basin, criteria of demand were not elaborated and current practice does not give guarantees that annual water allocation would be fulfilled. This depends mainly on hydrological variability.

2. Situation assessment.

It is agreed that main cause of crisis is ineffective use of water resources mostly in agriculture. Measures on water saving (limitation, water charges) to fit water use with biological demand and introduction into practice concrete principles (water expense per hectare, water expense for production unit) give positive results. Equal expenses of water for different yields of cotton (15 th. m^3/ha for yield 3,0 and 1,5 th/ha) and rice (30 th. m^3/ha for yield 4,0 and 1,5 th/ha) witnesses unproductive and ineffective water use.

2.1. During recent few years' management, accounting, control, limitation and economic sanctions for water over-expenses began to be lost. It is not understandable why if non-allocation water to the Aral Sea is the main cause of the crisis attention to this problem is not paid. If this condition would not fulfilled how to stop the crisis and create resources for sustainable development of each country and whole region.

2.2. While biggest cities in the world expense 100-150 l/day per capita, region of crisis expenses 400-600 l/day per capita and the concept of its increase "is being developed".

In the countries with dry climate annual water expenses per capita are 300-1000 m^3, in some provinces within the area of disaster it mounts to 4000 m^3 and more and measures on its cut down are not foreseen.

Certain example can be shown witch could be achieved in future: Israel for 5 mln. people spends 1.8 bln. m^3 Amu Darya and Syr Darya basin with population of 35 mln. spends 100 bln. m^3 under constant deficit of water.

2.3. Water discharge dynamics during recent years can be illustrated by water diversion volume from Amu Darya and Syr Darya rivers (without Zerafshan, Murgab, Tedzhen, etc.) (km^3):

1992 - 84,3; 1993 - 82,2; 1994 - 79,5; 1995 - 73,4; 1996 - 89,8; 1997- 77,6 (dry year).

a) Water allocation to the Aral Sea decrease was: in 1989 - 354 km^3, in 1997- 210 km^3, i.e. 144 km^3;

b) Aral Sea horizon altitute decrease was: in 1989 - 39,08 m, in 1997 - 34.8 m, i.e. 4,28 m;

c) Aquatic area decrease was: in 1989 - 38,4 th. km^2, in 1997 - 28 th. km^2, i.e. 10,4 th. km^2;

d) Aquatic area decrease was as follow (th. km^2):

1992 - 0,9; 1993 - 0,7; 1994 - 0,7; 1995 - 1.2; 1996 - 1,6; 1997 - 1,7.

3. Main criteria of assessment of the problem and directions of the strategy of water resources rational use in the basin.

3.1. Public involvement into the measures on water saving.

Total area of irrigated lands in the Aral Sea basin accounts for near 8 mln. ha. and about 90 % of water is spent for irrigation. According to data of different specialists and institutions water use efficiency is different for each country, province and river basin. Development of the criteria of water resources use and their practical implementation are at the very beginning at allocation levels.

3.2. Public conscience is in position when people mostly are sure that the Aral Sea problem originates from water resources scarcity and insufficient competence of decision-makers or financial assistance of international organizations. This witnesses that society does not know about real situation because of:

absence of permanent information education and pressure about inefficient water use which exceeds 1.5-2.0 times real needs and that this inefficient use is performed by users themselves. Aral Sea problem is not exported problem but the product of society negative attitude.

3.3. Governmental (central and local) managerial institutions have not developed measures and do not undertake any concrete steps to cut down existing water use to the level of real needs.

It is widely understood that water saving requires huge investments for reconstruction of irrigation-drainage network and introduction of new technologies in agriculture. These measures are really very expensive. For instance, drip irrigation system instillation needs 4-7 th. USD per hectare. This system can help to achieve water consumption decrease from 11-13 th. m^3/ha to 4-5 th. m^3/ha. If only 10 % of 8 mln. ha would be transferred to drip irrigation it requires about 4-4.5 bln. USD, which is unbearable for the economy of the region.

Above mentioned approaches and criteria weakened assurance in the region if ability to undertake concrete measures which can give practical results. But even certain restrictions within period 1992-1995 cut down water expense on 7 bln. m^3 while society and water users were not involved in the process. Society and water users involvement can give 10-12 bln. m^3 water decreasing its expense from 11-13 th. m^3/ha to 9-10 th. m^3/ha but unfortunately this understanding is not still achieved.

3.4. Local and world analogies, proving inefficient water use in the region, are not accepted and attention is not paid to measures on water management and accounting together with limitations and incentives for water saving.

One of the real accessible and possible tool of ASBP is awareness of society about necessity of water saving and, in the first turn, permanent and reliable information strengthened by concrete data.

3.5. According to different sources of information only organizational and control measures can give during next 5-7 years sufficient amount of water for sustainable development of the region. For ecological situation stabilizing it is necessary 10-25 km^3 per year.

For 7.5-7.7 mln. ha of irrigated lands under conditions of year of average water supply 85-90 km^3 (gross) of water is spent or 11-13 th. m^3/ha from which about 20 % is spent due to shortage of water accounting, control and management.

Actual agricultural crops yield (cotton, grain), which encompass 70-85 % of land in the Amu Darya and Syr Darya basin, requires 2.5-3 th. m^3/ha (net), current requirements are 4-6 th. m^3/ha. By organizational and limitating measures water expenses can be decreased gradually on 10, 15, 20 km^3 per year. Taking into account 10-12 km^3 water allocation to the Aral Sea guaranteed water release to the Aral Sea could be 20-25-30 km^3. With these resources the Aral Sea horizon stabilization can be achieved.

3.6. Excessive water discharge especially during growing period, force to divert water fully from allocation natural sources (little rivers, springs, etc.) that causes their exhaustion and disappearance which, in turn, leads to common ecosystem destruction.

3.7. Water intakes in the upper reaches diminishes and deform flow of Amu Darya and Syr Darya rivers and lead to the state in the middle reaches when sometimes there are only wastes flow down the river. Public conscience is growing that the rivers are not only conveyance means but also natural objects constituting ecosystems and determining natural balance of the region.

4. Main aspects of ineffective water use influence on land productivity and salinization.

4.1. Ineffective water use increases water losses and provokes groundwater level increase and as a consequence salt mobilization within the root zone of agricultural crops, leads to yield decrease and salt accumulation within the arable layer.

4.2. Excessive groundwater saturation by salts requires special measures on their removal. This, in turn, increases load on collector-drainage network and requires additional expenditures for its cleaning and deepening, its additional extent. As a result significant areas fall out of cultivation. At the same time excessive water discharge requires additional load on irrigation network that is connected with certain additional expenditures.

Collector-drainage outflow increase is followed by its release to rivers and river water quality aggravation, and land productivity decrease while using this water for irrigation again.

4.3. Salt management directly depends on rational water use and the less water discharge:

a) the less salt insertion by irrigation water;

b) the less salt is mobilized by groundwater;

ñ) the less salt accumulation in soil due to transpiration;

d) the less saline water release into the rivers;

e) the better river water quality.

4.4. Economic factors, which are beyond water quality, play significant role.

Rational water use linked directly or indirectly with decrease of load on collector drainage network, may cut down expenditures as a whole if to take into consideration that almost 50 % of allocation irrigated lands in the region are irrigated by pumping stations or by wells which require high expenditures for energy supply.

5. Urgent objectives.

5.1. The Aral Sea crisis problem solution and ecological situation stabilization depend mostly on concrete measures, aimed to cut down unproductive water losses in the basin as whole and by each water user.

5.2. Necessity of unproductive water use decrease should become national conscience in all countries of the region.

5.3. In all countries on the basis of national strategy main principles should be recognized: water discharge according to production volume coming out of real water productivity and gradual movement to this goal.

a) State should take responsibility for development and gradual implementation of measures on ineffective water use decrease creating tools of influence, accounting and control;

b) Restriction measures, being unpopular and connected with some difficulties, should be main instrument to create appropriate public conscience;

c) National strategies do not foresee simultaneous achievement the same parameters. Main goal is recognition of this principle and movement in this direction.

ASSESSMENT
of rational water use in the states of
Central Asia in the Aral Sea basin

	Irrigated area, ha	Actual water intake per 1 ha, m^3/ha	Actual discharge with regard to precipitation, m^3/ha	Potential demand coming out biological requirement and water productivity, m^3/ha	Potential water resources for sustainable development of states on expense of water expenditures decrease per 1 ha, m^3/ha	Potential resources for prospective measures realization on water saving, bln. m^3
Kazakhstan	786	12354	14130	9660	4470	3,5
Kyrgizstan	430	11150	17680	5540	12140	5,2
Tadjikistan	719	15860	18055	8640	9415	6,8
Turkmenistan	1744	13355	15028	6240	8788	15,3
Uzbekistan	4280	12478	14900	7820	7080	30,3
Aral Sea basin	7959	12887	14690	7607	7083	56,3

Note 1. Data are accepted according to actual water discharge and precipitation as the region's potential foreseen for development using own water resources.

Note 1. Given discharges do not reflect actual effectiveness of water use per production unit i.e. per yield unit. At present only per hectare water expense is continued.

DECISION OF THE BOARD OF INTERNATIONAL FUND FOR ARAL SEA SAVING

About approval of the leader for management of the project "Water resources and environment management in the Aral Sea basin" (GEF Project).

March 12, 1998 Tashkent

1. To approve mr. Giniyatullin R.A. as a leader for management of the project "Water resources and environment management in the Aral Sea basin" (GEF Project) and charge him to complete project development and sign agreement with the World Bank for its implementation.

2. To establish, that GEF Project leader will be paid after his authority cessation as a Chairman of EC IFAS.

For the Republic of Kazakhstan Deputy Prime-Minister Zh.Karibjanov
For the Kyrgiz Republic Vice Prime-Minister K.Abdimomunov
For the Republic of Tadjikistan Deputy Prime-Minister I.Eshmirzoyev
For Turkmenistan Deputy Prime-Minister A.Dodonov
For the Republic of Uzbekistan Deputy Prime-Minister I.Djurabekov

DECISION OF THE BOARD OF INTERNATIONAL FUND FOR ARAL SEA SAVING

About information provision of the Aral Sea problems

March 12, 1998 Tashkent

1. To accept information about start of publications in the newspaper ”Noviy Den" with enlightening of the states of Central Asia activity related to the Aral Sea basin problems solution.

2. EC IFAS on expense of reparian states, countries-donors, humanitarian funds and other sources to provide the basis of the newspaper and organize their activity according to objectives and tasks of ASBR.

3. To establish, that the newspaper ”Noviy Den' " and magazine "Vestnik Arala" are special issues of EC IFAS with publication of necessary information advertisements for all countries of Central Asia connected with problems, projects and programmes of the Aral Sea basin.

4. EC IFAS, its branches and divisions, other organizations and entities in the Central Asian countries to felicitate information provision, issue and distribution of above publications.

5. To recognize reasonable to have in each Central Asian state one correspondent on expense of financial means transferred by each state to the national branches of the Fund.

For the Republic of Kazakhstan
For the Kyrgiz Republic

For the Republic of Tadjikistan
For Turkmenistan
For the Republic of Uzbekistan

DECISION OF THE BOARD OF INTERNATIONAL FUND FOR ARAL SEA SAVING

About assistance to the Regional Commission for Sustainable Development in Ashgabat for its activity strengthening

March 12, 1998 Tashkent

1. To accept proposal of Turkmenistan about financing of the Scientific-Information Center of the Commission for Sustainable Development in Ashgabat (8 persons on expense of Turkmenistan contributions) and the branches in the states of Central Asia (3 persons in each) on expense of states-founders.

2. EC IFAS to submit to the governments of Central Asia the lists of personnel and cost estimate for the Scientific-Information Center of the Commission for Sustainable Development and its branches maintenance.

For the Republic of Kazakhstan
For the Kyrgiz Republic
For the Republic of Tadjikistan
For Turkmenistan
For the Republic of Uzbekistan

PROCEEDING NO 17

of the meeting of International Coordination Water Commission (ICWC) of the Republic of Kazakhstan, the Kyrgyz Republic, the Republic of Tadjikistan, Turkmenistan and the Republic of Uzbekistan

February 21, 1998 Ashgabat

Attendees: ICWC Members

Sarsenbekov T.T.	Chairman of the State Committee of Water Resources of the Republic of Kazakhstan
Kostyuk A.V.	First Deputy Director General of the Water Department of the Ministry of Agriculture and Water Management of the Kyrgyz Republic
Nazriyev M.N.	First Deputy Minister of Water Management of the Republic of Tadjikistan
Altiyev T.A.	Deputy Minister of Water Management of Turkmenistan
Djalalov A.A.	First Deputy Minister of Agriculture and Water Management of the Republic of Uzbekistan

From ICWC Organizations

Kalandarov I.D.	Director BWO «Amu Darya»
Lisenko O.G.	Head of Water Resources Department BWO «Amu Darya»
Khamidov M. Kh.	Director BWO «Syr Darya»
Leshansky A.I.	Head of Division of water allocation and water balance of BWO «Syr Darya»
Dukhovny V.A.	Director SIC ICWC

Invited persons

Khanmedova A.O.	Head of Water Resources and Water use Division of the Cabinet of Ministers of Turkmenistan
Sarkisov M.N.	Deputy Minister, Director Institute "Turkmengiprovodkhoz"
Goshayev D.G.	Head of Department of operation and maintenance of the Ministry for Water Management of Turkmenistan
Saparov U.B,	Director of Hydromeliorative expedition of the Ministry for Water Management of Turkmenistan

Deputy Minister of Water Management of Turkmenistan mr. Altiyev T.A. was as a Chairman.

AGENDA

1. Consideration and approval of operation regime of water-reservoirs cascades and limits for 1998 (responsible: BWO "Amu Darya, BWO "Syr Darya");

2. Programme of organisational-financial provision of ICWC and its entities activity in 1998 and next 5 years, including:

Plan of maintenance financing;

Plan of design scientific work of SIC ICWC and its organizations;

Plan of measures on dryness drought overcoming:

Plan of activities on hydrometeoservices and water accounting improvement

(responsible: ICWC members, BWO "Amu Darya, BWO "Syr Darya", SIC ICWC).

3. About readiness of interstate systems and structures to the growing period of 1998

(responsible: ICWC members, BWO "Amu Darya, BWO "Syr Darya").

4. Additional question "About organization of Central Asian consulting association on water-related problems".

Exchanging by opinions ICWC members decided:

On the 1st question

1. To approve water-intake limits from Amu Darya and Syr Darya rivers and regimes of water reservoirs cascade operation on 1997-1998 hydrological year, including non-vegetation period, and water releases volume to the Aral Sea and adjacent area according to appendix 1. After receiving Hydrometservice forecast about water provision for the growing period of 1998 BWO "Syr Darya" and BWO "Amu Darya" to precise regimes of cascades operation within the growing season and agree it with ICWC members.

BWO "Syr Darya" (Mr. Khamidov) to undertake measures on water supply to Chardara reservoir during the growing season in amount not less than 4.5 - 5 km^3 under conditions of high lateral inflow to the Syr Darya trunk simultaneously smoothing water provision of the republic-water users according to the interstate agreement of 18.02.1992. Kairakkum reservoir operation regime should be executed according to the BWO "Syr Darya" scheduling.

2. ICWC members to undertake permanent control on intergovernmental agreements fulfillment on the Naryn-Syr Darya cascade water-energetic resources use, to promote accomplishment of mutual supply and payment for electricity, gas and coal between Kazakhstan, Uzbekistan and Kyrgizstan according to above agreements.

3. Taking into account that Governments of the Republic of Kazakhstan and the Republic of Uzbekistan have already agreed the draft projects of three agreements submitted by ICWC. (Letters of 03.07.1997), to ask ICWC members of the Kyrgiz Republic, the Republic of Tadjikistan and Turkmenistan to undertake appropriate measures to accelerate concordance of above projects by their government.

On the 2nd question.

1. To approve cost estimate for financing maintenance needs of water-organisations BWO "Syr Darya" and BWO "Amu Darya" on 1998 at the level of last year with regard to indexation and charge both BWO's together with ICWC experts within a month to prepare and submit to financial entities of the Central Asian states information grounding their expenditures for consideration and approval.

2. To approve SIC ICWC plan and cost estimate according to appendices and ask IFAS to finance these expenditures in 1998 and next years on expense of contributions to the Fund and other sources, bearing in mind that its activity is addressed to creation of the mechanism of sustainable development and management by water resources in the Aral Sea

basin, which fully coincide with the tasks of the "Programme of concrete actions", approved by the Head of states on January 11, 1994.

3. To approve the plan of measures on drought overcoming submitted by BWO "Syr Darya" and BWO "Amu Darya" engaging all water-related organizations of the region together with BWO's to take active part in its implementation-according to the appendix to the 2nd question.

On the 3rd question

1. BWO "Amu Darya" and BWO "Syr Darya" should provide to the beginning of the growing season of 1998 full workability of the interstate systems and structures. Water-related organisations - ICWC members should help them in this work fulfillment.

2. To oblige BWO's and the ministries-owners of structures to prepare to next ICWC meeting plan of reconstruction and repair of these structures in order to avoid loss of manageability on the interstate water ways in the future. ICWC members should find financial means for works accomplishment on structure rehabilitation and reconstruction.

On the 4th question

1. "Aral Water Consult" is a association of water-organisations and reserve persons of five states of Central Asia in area of water resources, irrigation and environment management and protection. Its main goal is coordination of the regional projects preparation and implementation funded by the states of the region and international donors in close connection with the SIC ICWC regional and national organisations.

2. To establish that "Aral Water Consult" is accountable to ICWC in activities within the region.

According to T.Sarsenbekov proposal the following question is included: taking into account raising requirements to water resources management at the interstate level and necessity of giving BWO's international status to prepare appropriate proposals to the next ICWC meeting (responsible: SIC ICWC, BWO "Amu Darya, BWO "Syr Darya",).

Next ICWC meeting should be held in April 1998 in the Republic of Kazakhstan.

Agenda of the ICWC 19th meeting.

1. Results of the non-vegetation period of 1997-1998 and precising of cascades operation regimes and water-intake limits in the Amu Darya and Syr Darya basin within the growing season of 1998 (responsible: BWO "Amu Darya", BWO "Syr Darya").

2. About the progress in creation of the regional information system for water resources use and main provisions on information exchange (responsible: SIC ICWC).

3. About BWO "Amu Darya" and BWO "Syr Darya" international status
(responsible: BWO "Amu Darya", BWO "Syr Darya")

4. About the ICWC next meeting agenda.

For the Republic of Kazakhstan	T.Sarsenbekov
For the Kyrgiz Republic	A.Kostyuk
For the Republic of Tadjikistan	M.Nazriyev
For Turkmenistan	T.Altiyev.
For the Republic of Uzbekistan	A.Djalalov

Appendix N1

to the proceeding of ICWC meeting
of February 21, 1998 in Ashgabat

Water-intake limits from Amu Darya and Syr Darya rivers
and water allocation to the Aral Sea and river deltas
in 1997-1998 hydrological year

River basin, state	Water-intake limits, km^3		
	total per year since 1.10.97 till 1.10.98	including for non-vegetation period (since 1.10.97 till 1.04.98)	including for growing season (since 1.04.98 till 1.10.98)
Total from Syrdarya river including	19,570	3,070	16,500
Republic of Kazakhstan	7,370	0,500	6,870
Republic of Kyrgyzstan	0,200	0,020	0,180
Republic of Tadjikistan	1,800	0,200	1,600
Republic of Uzbekistan	10,200	2,350	7,850
Water allocation to the Aral sea	3,000	2,000	1,000
Total from Amu Darya river, including:	52,080	14,065	38,015
Republic of Tadjikistan	7,900	2,100	5,800
Republic of Kyrgyzstan	0,180	-	0,180
From Amu Darya river according to gauging station Kerky	44,000	11,965	32,035
Turkmenistan	22,000	6,000	16,000
Republic of Uzbekistan	22,000	5,965	16,035
Besides:			
Water allocation to the Aral Sea adjacent areas with regard to irrigation releases and return waters	4,500	1,500	3,000
sanitary-epidemiological releases in irrigation systems	0,800	0,800	-
Tashauz viloyat	0,150	0,150	-
Horezm viloyat	0,150	0,150	-
Karakalpak Republic	0,500	0,500	-
Total to the Aral Sea and adjacent areas	7,500	3,500	4,000

Note. 1. Water-intake limits foresee water allocation for irrigation and industrial-domestic needs. Under water supply change water limits would be accordingly changed.

2. Under higher water supply of Amu Darya all water volume will be directed to the Aral Sea.

Appendix N 2
to the 1st question of proceedings N 18
of ICWC meeting on February 21, 1998 in Ashgabat

CONSIDERATION AND APPROVAL OF RESERVOIRS' CASCADES OPERATION REGIMES AND WATER-INTAKE LIMITS IN 1998

Grounding of water-intake limits and regime of Naryn-Syr Darya reservoirs cascade operation in 1997-1998 hydrological year.

At the ICWC meeting of September 26, 1997 in Tashkent BWO "Syr Darya" was obliged to elaborate and agree with ICWC members operational regime of the Naryn-SyrDarya cascade and water-intake limits from Syr Darya in 1997-1998 hydrological year taking for basis protocol decision of working meeting of September 4-5, 1997 in Bishkek and restrictions in Kairakkum reservoir release up to altitude 343,5 m.

Grounding of releases value and dynamics from Toktogul reservoir in 1997-1998 was executed by BWO "Syr Darya" within the framework of preparation to the working meeting of the representatives of fuel-energetic and water-related complexes of Kazakhstan, Kyrgizstan, Tadjikistan and Uzbekistan on the problem of rational use water-energetic resources of Naryn-Syr Darya cascade which during few recent years prepares recommendations on regime of water releases from the reservoir and the volume of compensative supply of energy-bearers providing above releases.

Decisions which were accepted in recent years were aimed to establish such releases from Toktogul water-reservoir, which would allow to come out of crisis only during given growing season. Whole situation was imposed because of current non-vegetation releases the reservoir uninterruptedly goes down and would achieve a dead volume by the beginning of 1998. That was demonstrated by forecast calculations whose results were reported in Djambul in December 1996. Main conclusion was that it is necessary to ground releases volume and regime during non-vegetation period and compensate retained in the reservoir water to Kyrgizenergoholding. Only in this case it would be possible to recover and keep determinating role of Toktogul hydrostructure in long-term regulation of the Syr Darya river flow. Under certain conditions water saved in Toktogul during winter will be sufficient for irrigation needs and only in extreme cases (very dry year) additional resources will be needed. Establishing control over winter releases from Toktogul reservoir it will be possible to avoid such releases from Chardara reservoir on the territory of Uzbekistan (in Arnasay sink) which occurred regularly all resent years after Toktogul transition in energetic regime.

Thus, it is required to ground such autumn-winter releases from Toktogul, which allows:

- to restore regulating ability of Toktogul reservoir in long-term period and provide normal functioning of all agricultural sector in the Syr Darya river basin;
- to prevent water losses and damage which is caused by water releases to the Arnasay sink.

Calculations performed for the meeting in Bishkek allowed to define the boundaries of possible releases from Toktogul (3-5,5 km^3), those following create premises for accomplishment of above possibilities.

Taking into consideration given situation the Kyrgiz Republic during the working meeting on September 4-5, 1997 stated about decrease in own energy consumption on 10 % versus 1997 values; the meeting recommended the following regime of non-vegetation releases from the Toktogul reservoir:

- October - 185 m^3/sec, November - 395 m^3/sec, December - 460 m^3/sec, January - 495 m^3/sec, February - 490 m^3/sec, March - 300 m^3/sec.

Analogous indices for the growing season:

- May - 270 m^3/sec, June - 500 m^3/sec, July - 650 m^3/sec, August - 600 m^3/sec, September - 190 m^3/sec.

For provision of above releases Kazakhstan and Uzbekistan should accept in their energy-systems during summer period 1.1 bln.kvh electricity which is made by the Naryn cascade hydrostructures with its compensation to Kyrgizstan by back electricity flow from Uzbekistan and Kazakhstan during autumn-winter period of 1997-1998 hydrological year and energy resources supply: gas from Uzbekistan and coal from Kazakhstan; appropriate supply is reserved by the protocol of the meeting in Bishkek.

Recommended by the meeting regime of releases from the Toktogul reservoir according to ICWC decision was taken as a basis for calculation of the Naryn-SyrDarya reservoirs cascade operation regime in 1997-1998; restrictions for the Kairakkum reservoir emptying were adopted by ICWC decision (not lower than 343,5 m under water volume 171 mln. m^3 - for normal operation of the Makhram pumping station).

For non-vegetation period forecast was provided by Uzglavgidromet as annually; quarterly and monthly since October till February. Watershed size within a basin during non-vegetation period is accepted within the limits established by ICWC in recent years for the year of middle water supply (3.07 mln. m^3). Calculations took into account water losses from reservoirs and channel losses including the river reaches from Chardara reservoir to the Aral sea. Calculated regime of the Naryn-Syr Darya reservoirs cascade operation during non-vegetation period taking into consideration actual indices of its completed part (October-January) is represented in the table 1. Under given initial conditions channel reservoirs regime is grounded providing their filling to the beginning of vegetation and accomplishment of expected volume of water-intake. Water release to the Aral sea will be about 2 km^3, at the same time while following calculated regime of the Chardara reservoir no releases to the Arnasay sink are needed.

Water-intake limits for growing season are shown in the table 3.

As said before the working meeting in Bishkek recommended volume and regime of vegetation releases from the Toktogul reservoir under condition of fulfillment of the interstate agreements on compensation supplies fuel and energetic resources.

Water resources forecast for growing season was difficult because Uzglavgidromet gives its forecasts at the beginning of March and April 1998. Using long-term forecast data and analogy calculated values were accepted for lateral inflow to the Syr Darya river trunk. Water-intakes were taken, like non-growing period, within the ICWC limits for year of average water supply (18,5 km^3). Limit of emptying of the channel reservoirs is accepted: for Kairakkum reservoir up to altitude 343.5 m (ICWC protocol N 17, section 4, item 2), for Chardara reservoir - up to altitude 243,74 (with volume 800 mln.m^3). It is worth to note that Tadjikistan and Uzbekistan undertake measures on use of useful volume of the Kairakkum reservoir up to altitude 340,5 m what leading channel to the pumping station "Makhram" is being cleaned for. Interstate agreement of February 4, signed in Dushanbe mentioned that Uzbekistan provides electricity overflow in March - April 1998 into energetic system of Tadjikistan in amount of 100 mln. kvh with return in summer period and continues cleaning of the leading channel to the "Makhram" pumping station for preservation of water resources in summer period in the reservoir. In this case possibility appears to use additionally near 850 mln. m^3 water from the Kairakkum reservoir. It takes into account channel losses and losses from the reservoirs. Aral sea and delta share will be 1 km^3. Calculations of cascade operation regime within the growing season under given conditions and water-intake limits were performed by BWO "Syr Darya" and submitted to the ICWC members for agreement at the

end of October 1997.

Using preliminary water resources forecast for growing season (N 25, 07.1812 of 9.01.1998) BWO "Syr Darya" calculated again cascade operation regime during growing season under initial conditions. Calculations showed that water resources deficit will be 2 km^3 or 10.8 % of accepted water-intake. Water-intake limits were corrected on this value and the Naryn-SyrDarya reservoirs cascade operation regime was re-calculated (table 2). Water-intake limits on 1997-1998 are represented in the table 3. After receiving Hydrometservice forecast in March-April water-intake limits and cascade operation regimes will be precised if necessary.

It should be noted that analysis of the Naryn-Syr Darya cascade operation regime during the growing period's part of current year (table 1) witnesses about necessity of strict observance of accepted obligations.

At present time it can not be said so because in October-December 1997 agreements were still not signed and since the beginning of this year they are not fulfilled timely. It is worth to note, that during period since the beginning of a vegetation till February 1 from the Toktogul reservoir 570 mln. km^3 were released over planned before and while lateral inflow, especially within Fergana valley, was one third higher, inflow to the channel reservoir has sharply increased and releases from them have also increased. For instance, from the Kairakkum reservoir during the same period releases were 1360 mln. m^3 higher to compare with planned ones. Strict observance of agreements signed will permit to preserve water within the Toktogul reservoir's bowl and accomplish planned regime of its operation during vegetation of a current year.

SCHEDULE - FORECAST
of the Naryn-SyrDarya reservoirs cascade operation regime
for the period since October 1, 1997 till March 31, 1998

	Unit	October	November	December	January	February	March	Total
		fact	fact	fact	fact	fact	fact	fact
CHARVAK RESERVOIR								
Inflow to reservoir (sum of 3	m^3/sec	87	73	62	58	57	72	
rivers)	mln. m^3	233	189	166	155	138	193	1074
Volume: beginning of period	mln. m^3	1297	1080	995	971	873	841	
end of period	mln. m^3	1079	1005	949	916	841	800	
End of period (fact)	mln. m^3	1080	995	971	873	-	-	-
Release from reservoir	m^3/sec	167	101	79	78	70	87	
	mln. m^3	447	262	212	209	169	233	1532
ANDIJAN RESERVOIR								
Inflow to reservoir	m^3/sec	37	36	51	54	50	58	
	mln. m^3	99	93	137	145	121	155	750
Volume: beginning of period	mln. m^3	379	220	227	345	463	540	
end of period	mln. m^3	228	230	339	465	540	647	
End of period (fact)	mln. m^3	220	227	345	463	-	-	-
Release from reservoir	m^3/sec	93	32	9	9	18	18	
	mln. m^3	249	83	24	24	44	48	472
TOKTOGUL RESERVOIR								
Inflow to reservoir	m^3/sec	206	183	175	161	151	155	
	mln. m^3	552	474	469	431	365	415	2706
Volume: beginning of period	mln. m^3	11790	11853	11174	10215	9001	8096	
end of period	mln. m^3	11890	11154	10215	9050	8096	7707	
End of period (fact)	mln. m^3	11853	11174	10215	9001	-	-	-
Release from reservoir	m^3/sec	167	451	532	596	525	300	
	mln. m^3	447	1169	1425	1596	1270	804	6711
KAYRAKKUM RESERVOIR								
Inflow to reservoir	m^3/sec	252	614	815	826	804	457	
	mln. m^3	675	1591	2183	2212	1945	1224	9831
Volume: beginning of period	mln. m^3	1710	1684	2026	2731	3065	3133	
end of period	mln. m^3	1716	2039	2559	2731	3133	3418	
End of period (fact)	mln. m^3	1684	2026	2731	3065	-	-	-
Release from reservoir	m^3/sec	247	490	630	846	800	374	
	mln. m^3	662	1270	1687	2266	1935	1003	8823
CHARDARA RESERVOIR								
Inflow to reservoir	m^3/sec	178	454	682	865	895	428	
	mln. m^3	477	1177	1827	2317	2165	1145	9107
Volume: beginning of period	mln. m^3	616	663	1263	2189	3610	4979	
end of period	mln. m^3	726	1220	2208	3629	4979	5400	
End of period (fact)	mln. m^3	663	1263	2189	3610	-	-	-
Release from reservoir	m^3/sec	145	262	360	360	360	287	
	mln. m^3	388	679	964	964	871	770	4637
Release to Karakum canal	m^3/sec	5	2	0	2	5	5	
	mln. m^3	13	5	0	5	12	13	49
Release to Aral Sea (fact)	m^3/sec	110	95	70	150	-	-	1130

SCHEDULE - FORECAST
of the Naryn-SyrDarya reservoirs cascade operation regime
for the period since April 1, 1998 till September 30, 1998

		April	May	June	July	August	September	TOTAL mln. m^3
CHARVAK RESERVOIR								
Inflow to reservoir (sum of 3	m^3/sec	169	330	438	331	186	107	
rivers)	mln. m^3	438	884	1135	887	498	277	4119
Volume: beginning of period	mln. m^3	800	978	1539	1883	1619	1090	
end of period	mln. m^3	978	1539	1883	1619	1090	923	
Release from reservoir	m^3/sec	100	120	304	428	382	170	
	mln. m^3	259	321	788	1146	1023	441	3979
ANDIJAN RESERVOIR								
Inflow to reservoir	m^3/sec	103	184	198	128	63	41	
	mln. m^3	267	493	513	343	169	106	1891
Volume: beginning of period	mln. m^3	647	654	824	948	752	471	
end of period	mln. m^3	654	824	948	752	471	445	
Release from reservoir	m^3/sec	100	120	150	200	167	50	
	mln. m^3	259	321	389	536	447	130	2082
TOKTOGUL RESERVOIR								
Inflow to reservoir	m^3/sec	207	452	701	615	424	234	
	mln. m^3	537	1211	1817	1647	1136	607	6954
Volume: beginning of period	mln. m^3	7707	7644	8128	8646	8541	8054	
end of period	mln. m^3	7644	8128	8646	8541	8054	8150	
Release from reservoir	m^3/sec	230	270	500	650	600	190	
	mln. m^3	596	723	1296	1741	1607	492	6456
KAYRAKKUM RESERVOIR								
Inflow to reservoir	m^3/sec	371	434	458	508	522	274	
	mln. m^3	962	1162	1187	1361	1398	710	6780
Volume: beginning of period	mln. m^3	3418	3418	3418	2897	2164	1716	
end of period	mln. m^3	3418	3418	2897	2164	1716	1716	
Release from reservoir	m^3/sec	367	396	590	700	637	252	
	mln. m^3	950	1062	1529	1875	1706	653	7775
CHARDARA RESERVOIR								
Inflow to reservoir	m^3/sec	282	326	240	144	183	274	
	mln. m^3	730	874	622	386	490	710	3812
Volume: beginning of period	mln. m^3	5400	5378	4273	2964	1513	800	
end of period	mln. m^3	5378	4273	2964	1513	800	1069	
Release from reservoir	m^3/sec	248	626	626	576	384	165	
	mln. m^3	643	1677	1623	1543	1028	428	6941
Release to Kzylkum canal	mln. m^3	13	98	106	120	85	18	
		34	262	275	321	228	47	1167
	m^3/sec	63	63	63	63	63	63	
Release to Aral Sea (fact)	mln. m^3	163	169	163	169	169	163	996

Water-intake limits from Syr Darya river
and water releases to the Aral Sea and Amu Darya
delta in 1997-1998 hydrological year.

River basin, state	Water-intake limits, km^3		
	Total for year since 1.10.97 till 1.10.98	Including non-vegetation period (since 1.10.1997 till 1.04.1998)	Including vegetation period (since 1.04.1998 till 1.10.1998)
Total from Syr Darya river	19,57	3,07	16,50
Including:			
Uzbekistan	10,20	2,35	7,85
Kazakhstan	7,37	0,50	6,87
Kyrgizstan	0,20	0,02	0,18
Tadjikistan	1,80	0,20	1,60
Besides:			
Releases to the Aral sea	3,00	2,00	1,00

Water-intake limits foresee water supply for irrigation, industrial-domestic and other needs. Under basin water supply changes water-intake limits will be accordingly corrected.

Appendix 3
to the 1st question of the protocol N 18
of the ICWC meeting of February 21, 1998 in Ashgabat

WATER-INTAKE LIMITS AND WATER RESERVOIRS OPERATION REGIME GROUNDING WITHIN THE AMU DARYA BASIN

On September 26, 1997 in Tashkent during ICWC meeting control figures on reservoirs operation regime of 1997-1998 were approved.

After ICWC meeting water-intake limits were developed by the states of the basin.

Name	Limit for non-vegetation period, mln m^3
Tadjikistan	2914
Uzbekistan	5965
Turkmenistan	6000
Total for basin	14879
Besides, Surhandarya province	200
Sanitary release to irrigation systems, total including	750
Karakalpak Republic	500
Horezm	150
Tashauz	100

Established water intake limits use on 11.02.98
(reported period of non-vegetation) are as follows

Name	Limit for non-vegetation	Incremental on 11.02.98		Percentage	
		limit	fact	from incremental	from total
Tadjikistan	2914	2028	1711.2	84.4	58.7
Uzbekistan	5965	3223.1	3303.4	102.5	55.4
Turkmenistan	6000	3213.2	3016.5	93.9	50.3
Total	14879	8464.3	8031.2	94.9	54
Sanitary release, total including	750	651.8	506.2	77.2	67.5
1. Horezm	150	150	63.5	42.4	42.4
2. Karakalpak Republic	500	401.8	280.5	69.8	56.1
3. Tashauz	100	100	162.2	162.2	162.2
Total for basin	15629	9116.1	8537.4	93.7	54.6
Besides Surhandarya province	200	39.8	233.9	167.3	117

Established water-intake use over the river reaches are as follow:

upper reaches - 84.4 %;

middle reaches - 109.3 %;

lower reaches - 54.1 %, including Uzbekistan - 51.0 %, Turkmenistan - 51.0 %/

Appeared disproportion in water use level between middle and lower reaches is explained by the following factors:

1. Significant difference in climatic conditions between river reaches;

2. Coordinated shift of the capital leaching beginning in low reaches for later date with purpose to create optimal water storage in the Tuyamuyun reservoir and more rational water resources use in the lower reaches.

Due to undertaken measures water storage in the Tuyamuyun reservoir on 11.02.1998 was 6505 mln. m^3 or 557 mln. m^3 more to compare with last year. However, it is necessary to take into account that established limit in the lower reaches for non-vegetation period was fulfilled only on 16.4 %. Rest of unused volume without regard to losses is 4468 mln. m^3, including:

according to the limits - 3575 mln. m^3;

sanitary releases - 306.0 mln. m^3;

releases to the Aral sea - 587 mln. m^3.

With regard to losses calculated volume of water use in the river lower reaches is 5.14-5.36 km^3 for the rest of non-vegetation period.

Under such water use and with regard to foreseen water supply on February and March the Tuyamuyun reservoir volume at the beginning of the growing season will be 3.4-4.2 km^3. This foreseen water situation in the lower reaches, from our point of view will permit to decrease tension in water supply within the first month of the growing season. Established limit for sanitary releases was used during reported period for 77.7 %, including: Horezm - 42.3 %; Tashauz - 162.2 %; Karakalpakstan - 69.8 %.

Plan for water supply to the Aral sea on 1.02.98 is fulfilled for 59.6 % versus planned 1000 mln. m^3 was supplied 5.96 mln. m^3; in 1997 at this date 2475 mln. m^3 were supplied.

Water volume in the Nurek reservoir on 1.02.98 was 6.95 mln. m^3, on 11.02.97 it was 7.11 km^3.

Water volume in the in-system reservoirs is 4.15 km^3, last year it was 2.69 km^3 or 1.96 km^3 more.

Four months of non-vegetation period have proved water supply forecast done by Uzglavgidromet . River flow in specific site Kerky during reported period was 10.04 km^3 or 99.6 % of norm in 1996-1997 flow was 14.17 km^3.

According to the Uzglavgidromet forecast foreseen water supply during the 1st quater will be 82-105 % or, on average 93.6 %; in January actual flow was 2.26 km^3; in 1997 it was 3.1 km^3 or 0.80 km^3 more. In February water supply in the Kerky site will be 56.2-68.7 % of norm. BWO "Amu Darya" supposes that forecast for February was reduced by Uzglavgidromet.

With regard to the Uzglavgidromet forecast for the 1st quarter of 1998 and actual flow in Kerky site expected flow during non-vegetation period will be within the limits of 13.2-14.8 km^3. It is suggested to accept calculated flow as 14.6 km^3.

Analyzing hydrology of low water supply cycles is supposed that total flow in the Kerky site upstream of Karakum canal in 1997-1998 hydrological year will be 55.4-56.8 km^3 or on average 56.1 km^3. This value is proposed to be accepted as a calculated value, including 14.6 km^3 for non-vegetation period and for growing period - 41.5 km^3. Preliminary Uzglavgidromet prediction for growing season varies within 39.5-42.7 km^3.

It is necessary to note, that predicted flow in the Kerky site for 1997-1998 hydrological year is practically on the level of last year.

Still water supply distribution on the periods significantly differs. For instance, in 1996-1997 during non-vegetation period water supply was 20,2 km^3, in 1997-1998 hydrological year it is expected as 14.6 km^3 or 5.6 km^3 less; at the same time water supply during growing season is expected as 5.8 km^3 more than the fact of 1997 (35.7 km^3).

With regard to above mentioned and current water situation is suggested to take for a basis the following control figures for the hydrological intakes upstream of Karakum canal - 41.6 km^3 (last year level).

Water-intake limits from Amu Darya and releases to the Aral sea for 1997-1998 hydrological year are submitted for consideration.

BWO "Amu Darya" submits to ICWC consideration regime of the reservoirs cascade operation for non-vegetation and growing periods.

It also proposes its opinion on development of water resources distribution mechanism under condition of dry year (lack of water resources) on 1997-1998 hydrological year in connection with actual water use within the Amu Darya river middle and lower reaches.

1. If the states during vegetation and non-vegetation periods keep parity of water use, in the lower reaches water allocation is performed according to approved water-intake shares.

2. While calculating water-intake shares approved quota of water supply to the delta and Aral Sea is taken into consideration. By other words, the river delta and the Aral sea during hydrological year will be equivalent water user and will receive own water resources share depending on water supply to the river lower reaches.

For instance, for non-vegetation period water releases to the delta via Takhiatash hydrostructure are foreseen as 50 m^3/sec which will be considered equally to other water users according to water situation changes.

3. Water allocation share (taking into account the Aral sea) is established each ten days according to the rest of limits. If some water user will overtake water, next ten days his share will be cut down. Thus flexible system of water use will be created taking into account any deviations and keeping equitable water allocation.

4. Taking into consideration ICWC proposals BWO "Amu Darya" operational divisions created for water-intake control and accounting within the Tuyamuyun reservoir zone with attraction of all interested sides.

If losses within Tuyamuyun-Takhiatash river reaches will exceed average perennial value during certain period of time, difference will be accounted in the unit of each water user depending on water allocation share.

5. In order to rise responsibility of each state in keeping of water use parity all over the river is recommended to establish the following order of water-intakes re-regulation.

While surplus is admitted by any state within the middle reaches BWO "Amu Darya" is permitted to undertake correction of established limits over the water users of this state (to cut down established limit of water users within the lower reaches).

Water-intake limits from the Amu Darya river and its delta during 1997-1998 hydrological year, including non-vegetation and vegetation periods

River basin, state	Water-intake limits, km^3		
	total annual (since 1.10.97 till 1.10.98)	including for non-vegetation period (since 1.10.97 till 1.04.98)	including for vegetation period (since 1.04.98 till 1.10.98)
Totally from Amu Darya	49,65	14,365	35,285
including:			
• Tadjikistan	7,9	2,40	5,5
• Kyrgizstan	0,15	-	0,15
• From Amu Darya in Kerky site	41,6	11,965	29,635
Total			
• Turkmenistan	20,8	6,0	14,8
• Uzbekistan	20,8	5,965	14,835
Besides			
water supply to Aral Sea adjacent area with regard to irrigation releases and collector-drainage waters	4,50	1,50	3,00
Sanitary releases to irrigation systems			
Tashauz veloyat	0,15	0,15	-
Horezm veloyat	0,15	0,15	-
Karakalpak Republic	0,50	0,50	
Total to the Aral Sea and adjacent area	-	-	-

Note. Water-intake limits foresee water supply for irrigation, industrial-domestic needs, etc. Under basin water supply changes water-intake limits are accordingly corrected.

Schedule of Nurek and Tuyamuyun reservoirs operation for the period since October 1997 till March 1998

Nurek reservoir	Unit	Actually				Forecast		Total
		October	November	December	January	February	March	
Inflow to reservoir	m^3/sec	331	201	187	180	165	196	3303
Losses from reservoir	m^3/sec	-22	-17	-3	20	-64	3	-193
Volume: beginning of period	mln. m^3	10540	10180	9437	8487	7300	6573	10540
end of period	mln. m^3	10180	9437	8467	7300	6573	5964	5964
Accumulation (+), release (-)	mln. m^3	-360	-743	-970	-1187	-727	-609	-4576
Altitude: end of period	m	906,91	904,56	888,89	874,75	865,40	857,00	
Release from reservoir	m^3/sec	487	505	553	596	520	420	8074

Tuyamuyun reservoir	Unit	Actually				Forecast		Total
		October	November	December	January	February	March	
Inflow to reservoir	m^3/sec	693	634	686	747	630	680	10636
Losses from reservoir	m^3/sec	154	183	160	245	130	150	2687
Volume: beginning of period	mln. m^3	2682	3413	4182	5093	6091	5898	2682
end of period	mln. m^3	3413	4182	5093	6091	5898	4222	4222
Accumulation (+), release (-)	mln. m^3	731	769	911	998	-193	-1676	1540
Altitude: end of period	m	123,34	126,02	128,35	129,81	129,63	126,23	
Release from reservoir	m^3/sec	265	154	186	129	580	1156	6409

Schedule of Nurek and Tuyamuyun reservoirs operation for the period since April 1998 till September 1998

Nurek reservoir	Unit	Forecast						Total
		April	May	June	July	August	September	
Inflow to reservoir	m^3/sec	371	691	1053	1395	1197	603	13995
Losses from reservoir	m^3/sec	1	0	0	1	-1	-2	-3
Volume: beginning of period	mln. m^3	5964	5966	6076	7121	8848	10045	5964
end of period	mln. m^3	5966	6076	7121	8848	10045	10500	10500
Accumulation (+), release (-)	mln. m^3	2	110	1045	1727	1197	455	4536
Altitude: end of period	m	858,44	859,82	872,67	901,81	910,15	910	
Release from reservoir	m^3/sec	370	650	650	750	750	430	9486

Tuyamuyun reservoir	Unit	Forecast						Total
		April	May	June	July	August	September	
Inflow to reservoir	m^3/sec	691	1173	1988	2643	1990	1440	26227
Losses from reservoir	m^3/sec	197	269	490	520	381	139	5275
Volume: beginning of period	mln. m^3	4222	3942	2908	2570	2812	2855	4222
end of period	mln. m^3	3942	2908	2670	2812	2855	5035	5035
Accumulation (+), release (-)	mln. m^3	-260	-1034	-238	142	43	2180	813
Altitude: end of period	m	124,90	122,12	121,55	121,78	121,98	128,2	
Release from reservoir	m^3/sec	602	1290	1590	2070	1593	460	20140

Appendix N 1
to the 2nd question of the protocol N 18
of the ICWC meeting of February 21, 1998 in Ashgabat

Cost estimates
of operational needs of BWO "Syr Darya" and distribution of expenditures between states - ICWC members
on 1998 in national currency

Index	Uzbekistan, th. soum	Kazakhstan, th. tenge	Tadjikistan, th. ruble	Kyrgizstan, th. soum
A. Operational costs				
1. Salary	18460	15300	25050	48
2. Taxes - 40%	7580	6120	8050	17
3. Logistics	4800	3980	6500	10
4. Business trips	550	450	750	2
5. Operational costs,	100000	73900	154000	593
including repair	65872	48883	93220	365
SUB TOTAL	131390	99750	194350	670
B. Other costs				
1. Acquisition of equipment	15000	12600	22500	57
2. Capital repair	41000	40000	54950	250
TOTAL	187390	152350	271800	977

Appendix N 2
to the 2nd question of the protocol N 18
of the ICWC meeting of February 21, 1998 in Ashgabat

Cost estimates
of operational needs of BWO "Syr Darya" and
costs distribution between states - members of ICWC
on 1998 (in soums)

Index	Total needs, th. soum	Including on the countries			
		Uzbekistan	Kazakhstan	Tadjikistan	Kyrgizstan
A. Operational costs					
1. Salary	36445	18460	15300	2505	180
2. Taxes - 40%	14575	7580	6120	805	70
3. Logistics	9480	4800	3980	650	50
4. Business trips	1080	550	450	75	5
5. Operational costs,	191950	100000	73900	15400	2650
including repair	125680	65872	48883	9322	1603
SUB TOTAL	253530	131390	99750	19435	2955
B. Other costs					
1. Acquisition of equipment	30000	15000	12600	2250	150
2. Capital repair	87590	41000	40000	5495	1095
TOTAL	371120	187390	152350	27180	4200
Recalculation coefficient on 1.11.97			1	0,1	4,39

Appendix N 3
to the 2nd question of the protocol N 18
of the ICWC meeting of February 21, 1998 in Ashgabat

Cost estimates
of BWO "Syr Darya" and cost distribution between states - ICWC members
on 1998-2002 in national currency

State	Unit	1998	1999	2000	2001	2002
Uzbekistan	th. soum	187390	197000	207000	217000	228000
Kazakhstan	th. tenge	152350	160000	168000	176000	185000
Tadjikistan	th. ruble	271800	285000	300000	315000	330000
Kyrgizstan	th. soum	977	1000	1100	1100	1200

The same re-calculated in soums

State	Unit	1998	1999	2000	2001	2002
Uzbekistan	th. soum	187390	197000	207000	217000	228000
Kazakhstan	th. soum	152350	160000	168000	176000	185000
Tadjikistan	th. soum	27180	28600	30000	31500	33000
Kyrgizstan	th. soum	4200	4400	4600	4900	5100
		371120	390000	409600	429400	451100

Note. Re-calculation coefficient is as follow:
Uzbekistan - 1.0;
Tadjikistan - 0.1;
Kyrgizstan - 4.39.
Needs are provided on November 1997 for Uzbekistan.

Appendix N 4
to the 2nd question of the protocol N 18
of the ICWC meeting of February 21, 1998 in Ashgabat

Cost estimates
for operational needs of BWO "Amu Darya" and cost distribution between states - ICWC members
on 1998 in national currency

Index	Uzbekistan, th. soum	Kazakhstan, th. tenge	Tadjikistan, th. rouble	Turkmenistan, th. som
A. Operational costs	16612	-	18962,4	949058
1. Salary	6644,8	-	7585	379623,2
2. Taxes - 40%	14295	-	7000	245400
3. Logistics	2500	-	5000	435870
4. Business trips	261127	-	48979,2	12846840
5. Operational costs,	140417	-	31368,6	11459534
including repair	301178,8	-	87526,6	14856791,2
SUB TOTAL				
B. Other costs	18400	-	2000	6610155
1. Acquisition of equipment	36176	-	9895,4	1054000
2. Capital repair	355754,8	-	99422	22520946,2
TOTAL				

Appendix N 5
to the 2nd question of the protocol N 18
of the ICWC meeting of February 21, 1998 in Ashgabat

Cost estimates
for operational needs of BWO "Amu Darya" and costs distribution between states - ICWC members for the period 1998-2002 in national currency

State	Unit	1998	1999	2000	2001	2002
Uzbekistan	th. soum	355754,8	373542,5	392219,6	411830,6	432422,1
Tadjikistan	th. ruble	99422	104393,1	109612,7	115093,3	120847,9
Turkmenistan	th, manat	22520946,2	23646993	24829342	26070809	27374349

The same re-calculated

Uzbekistan	th. soum	355754,8	373542,5	392219,6	411830,6	432422,1
Tadjikistan	th. ruble	9942,2	10439,3	10961,3	11509,3	12084,8
Turkmenistan	th, manat	417055	437907,3	459802,6	482792,7	506932,4
Total		782752	821889,1	862983,5	906132,6	951439,3

Re-calculation coefficient on 1.11. 1997 is as follow:
Tadjikistan - 1 soum =10 ruble
Turkmenistan - 1 soum = 54 manats

Needs are provided in prices of November 1997 for Uzbekistan.

Appendix N 6
to the 2nd question of the protocol N 18
of the ICWC meeting of February 21, 1998 in Ashgabat

ABOUT THE PLAN OF SCIENTIFIC-RESEARCH ACTIVITY FOR PERIOD 1998-1999 "DEVELOP MAJOR COMPONENTS OF ICWC POLICY ON RATIONAL USE AND PRESERVATION OF WATER RESOURCES IN THE ARAL SEA BASIN"

According to decision of SIC ICWC Board of Directors of October 10, 1997 the plan of scientific-research activity on 1998-1999 is developed. Draft plan was disseminated among all states. The comments are obtained from "Turkmengiprovodkhoz", Ministry for Land Reclamation and Water Management of Tadjikistan, KazNIIVH Institute, Ministry of Agriculture and Water Management of Uzbekistan, SPA SANIIRI. All comments are considered. The plan includes 49 topics distributed in 6 problems. Preliminary cost estimates is performed in USD. Total cost is USD 911.4 th.

Cost distribution between states and organizations is shown in the table below.

Scientific-research activity costs within the ICWC plan on 1998, th. USD

State, organisation	Problem						Total
	1	2	3	4	5	6	
KazNIIVH	7,2	10,9	7,2	7,2	..	10,8	43,3
SIC ICWC Kazakh branch	2,4	..	10	..	44,5	..	56,9
Kazgiprovodkhoz	17,6	14,4	14,4	18	..	18	82,4
Kazakhstan	27,2	25,3	31,6	25,2	44,5	28,8	182,6
SIC ICWC Kyrgiz branch	..	..	..	..	34,5	..	34,5
Kyrgizgiprovodkhoz	9,6	7,2	7,2	12	..	4,8	40,8
KirgNII irrigation	..	..	2,4	..	..	..	2,4
IVPGNAN Kyrgizstan	2,4	..	..	..	..	..	2,4
PKTI Vodinformatika	10	..	..	..	17,2	..	27,2
Kyrgizstan	22	7,2	9,6	12	51,7	4,8	107,3
SIC ICWC Tadjik branch	..	..	..	..	34,5	..	34,5
SPA TadjNIIGIM	19,2	7,2	9,6	12	..	4,8	52,8
Tadjikistan	19,2	7,2	9,6	12	34,5	4,8	87,3
Turkmengiprovodkhoz	21,8	10,8	9,6	12	46,9	7,2	108,3
Turkmenistan	21,8	10,8	9,6	12	46,9	7,2	108,3
SIC ICWC	18,4	7,1	12,6	..	24,3	6,3	68,7
SPA SANIIRI	58,7	18,5	38,1	43	81,2	18,5	258
PO Vodproekt	2,1	6,3	10,5	6,3	7,5	..	32,7
SIC MAWM	..	..	..	..	6,3	..	6,3

State, organisation	Problem						Total
	1	2	3	4	5	6	
Tashgidroproekt	4,8	..	..	..	..	..	4,8
ODZ "Energia"	4,8	..	..	..	..	..	4,8
Uzbekistan	88,8	31,9	61,2	49,3	119,3	24,8	375,3
BWO "Syr Darya"	10,5	3,8	2,1	2,1	4,2	2,1	24,8
BWO "Amu Darya"	10,5	3,8	2,1	2,1	4,2	2,1	24,8
Total	200	90	125,8	114,7	306,3	74,6	911,4

Appendix N 7
to the 2nd question of the protocol N 18
of the ICWC meeting of February 21, 1998 in Ashgabat

ABOUT SCIENTIFIC-RESEARCH ACTIVITY FULFILLMENT ON INTERSTATE PROGRAMME "DEVELOP STRATEGY OF RATIONAL USE AND MANAGEMENT BY WATER RESOURCES PROVIDING GUARANTEED DEVELOPMENT OF THE CENTRAL ASIAN REGION'S ECONOMY AND NATURAL COMPLEXES RESTORATION TO THE LEVEL OF ECOLOGICAL EQUILIBRIUM"

Main problem of SIC ICWC scientific-research activity during 3 years (1996-1998) is "Development of main provisions of water related activity on rational use and preservation of water resources in the Aral Sea basin, providing fulfilment of the "Programme of concrete actions..." approved by Head of states of Central Asia in January, 1994.

Problem includes 10 tasks.

Task 01 is aimed to definition of main provisions of the regional strategy of water allocation, rational use and preservation of water resources in the Aral Sea basin. Within the framework of this task 6 topics were fulfilled.

As a result of this investigation the first version of unified model of water balance of the Aral Sea and separate zones was established, methodological recommendations on selection and evaluation of water allocation criteria, water use and water supply were developed. Methodological approaches and assessment of sustainable development of water resources management system in the Aral Sea basin are elaborated. Recommendations on organization of management by water-related economy perfection under conditions of market economy development and recommendations on land and water resources use efficiency increase. Set of predictive indices determinating water-related regions functioning efficiency on basis of analysis of current tendencies in water-related activity on irrigated lands is suggested.

Methodological base and calculation tools for assessment of water resources efficient use in industry, municipality and agriculture according to economic, social and ecological criteria is elaborated.

With assistance of German Society for technical co-operation (GIZ) Turkmengiprovodkhoz investigated agricultural production development optimization.

Task 02 is aimed to development of the set of organizational-technical measures on management by water quality in the trunks of Amu Darya and Syr Darya, its juridical and legal aspects. Within the framework of this task 6 topics were fulfilled during reported year. As a result is a methodology of requirements development and the 1st version of requirements to irrigation water quality in Syr Darya and Amu Darya basins with regard to soil-reclamative, water-economic (according to crop pattern), ecological and economic conditions of the region. Water withdrawal norm from irrigated lands industrial and domestic farms of Golodnaya Steppe (Syrdarya and Djizak provinces of Uzbekistan, Pakhtaaral and Kazbinbiysky districts of Kazakhstan) are developed. Prior measures (organizational, technical and water protection) on relationship between rivers and their command territories according to ecological requirements are determined. Alternative versions of collector-drainage waters withdrawal, providing decrease of water withdrawal and expenditures on construction and maintenance of drainage systems, are developed.

Task 03 is aimed to elaboration and grounding of measures on new sustainable natural-antropogenic profile of diminished Aral Sea and its adjacent area under conditions of water factor variability and water deficit.

It is foreseen to fulfill 3 topics.

The first edition of the strategy on the sea desiccated bottom and adjacent area natural complexes stabilization to mitigate environmental problems is prepared. Technology of sand fastening with help of "Structural - 95" and seeds granules is elaborated. Version of organizational measures on wetlands creation in the Amu Darya delta and within desiccated sea bottom is proposed. Results of feasibility study of special measures for prospective increase of releases and water deficit decrease in the Amu Darya and Syr Darya basins are assessed.

Task 04 is dedicated to development of pricing policy of water resources use in the Central Asian region and includes 3 topics.

Common water price model for water as a resource for different sources is prepared. Water-economic assessment of transboundary water resources formation and regulation and additional resources involvement is made. Organizational forms of agricultural water users transformation in associations of water users are recommended. Economic and legal aspects of interrelations between associations of water users and water-related organizations are considered. Conditions of in-system self-financing functioning are considered. Methodology of costs and incomes distribution assessment from water objects on the transboundary rivers is developed. In this activity funded by USAID Kazgiprovodkhoz, Turkmengiprovodkhoz, SPA TadjNIIGIM participated.

With assistance of USAID Turkmengiprovodkhoz investigated water use damage economic evaluation.

Task 05 is linked with introduction of the first line of the united automatized system of land and water integrated use and preservation and consists of 9 topics.

Regulations of machine exchange within relative data base of the Republic of Central Asia, its legal protection, equipment of information centers including telecommunication are elaborated. Software for water-salt balance and prospective planning of water resources use for the Aral Sea basin is prepared.

Input and output information forms models for the data base are developed. Data bases "land resources and irrigated agriculture at field-district level" for Syrdarya, Horezm provinces and Karakalpak Republic are formed. Algorithms for economic analysis and assessment of short-term and long-term plans of land and water resources use were elaborated. List of additional economic information, its forms in data base and TOR are prepared.

Algorithm and softwares of the block "Water resources management" and their adaptation within the process of operative management by water resources of the Syr Darya and Amu Darya rivers basin are prepared.

Models of input and output forms of information for data base "Irrigated lands productivity" are developed. Data base filling is performed on representative farms of Syrdarya, Djizak, Horezm provinces and Karakalpak Republic. Algorithms and softwares for calculation of different level of wheat, alfalfa, vegetables and potato yield are prepared. Unified standards, input and output forms of hydroecological information for data base are created. Remote observation system on basis of kartographic and space data has been created for Bukhara province and Karakalpak Republic. Algorithms, input and output forms for data base on assessment of technical state of observation points, pumping stations, etc. are developed.

Turkmengiprovodkhoz together with Turkmengiprozem have prepared economic-mathematical optimization model of water resources use.

With assistance of EU and within the framework of the WARMAP Project main principles and data collection system for irrigated lands productivity (WUFMAS) were elaborated. SPA SANIIRI, Kazgiprovodkhoz, KyrgizNII irrigation, SPA TadjikNIIGIM and Turkmengiprovodkhoz took part in this activity.

Work is started to transform this system in the instrument which permits to give recommendations on measures addressed to land and water productivity increase.

Task 06 is devoted to elaboration of the set of measures providing ecological equilibrium in the Aral Sea basin with regard to development of all economic branches of Central Asia and includes 2 topics.

Alternative versions of land and water resources use are developed for restoration of ecological equilibrium in the Aral Sea basin. The first edition of measures providing ecological equilibrium in upper watersheds in Uzbekistan is prepared.

Task 07 is addressed to development of united system of norms and water use correction in different branches of economy and consists of 2 topics.

United regional methodology of agricultural crops water use norms correction and water use in industry and municipal needs is prepared.

Methodology of water use, water allocation and water use prediction is approbated on basis of reference balance stations study.

Together with FAO the regional seminar on elaboration of unified regional approaches to water supply norms and CROPWAT norms adaptation was carried out.

With assistance of FAO and WMO investigations on comparison of local approaches with CROPWAT methodology is started. In this activity SPA SANIIRI, Kaz NIIVH, KyrgizNII Irrigation, SPA TadjikNIIGIM and Turkmengiprovodkhoz are taking part.

Task 08 is connected with development of scientific-grounded measures on flood and winter water pass over the Amu Darya and Syr Darya river basins and guaranteed water provision to the canals under human activity impact and includes 3 topics.

Measures of flood water pass through Karadarya river and water provision to the canals KMK and ABMK on Amu Darya river are developed. Correction of anti-flood measures along Amu Darya site from Tuyamuyun to Kipchak is made.

With EU assistance Kazgiprovodkhoz has developed measures on improving Syr Darya passing capability downstream Chardara in winter.

Task 09 is dedicated to perfection of water accounting technology on the objects of BWO "Syr Darya" and BWO "Amu Darya" and its methodological provision of in-farm water allocation with assistance of associations of water users and creation of the base of interstate standards on methods and technical means of control, accounting and management by water resources and consists of 3 topics.

The first edition of recommendations for regulated and non-regulated structures calibration for free flow regime is elaborated. Draft documentation for organization and financing of association of water users under conditions of agriculture reforms is prepared. The second edition of interstate standards on water measurements' and accounting means has been prepared.

Appendix N 8
To the protocol N 18 of ICWC
Meeting in Ashgabat

PLAN OF MEASURES OF LOW WATER SUPPLY (DROUGHT) OVERCOMMING

For successful overcoming of consequences of coming low water supply (drought) the following measures are necessary:

1. Strict observance of the Naryn-Syrdarya and Amu Darya operation regime approved by ICWC by all state entities in the Syr Darya river basin including energetic.

2. Strict observance of water-intake limits approved by ICWC by all water-users of the Central Asian states.

3. Do not allow local authorities interference in interstate water allocation realized by BWO "Syr Darya" and BWO "Amu Darya" that needs special provision of Prime of Vice Prime Minister on this question before growing season.

To create parity commissions on each river with attraction of leading specialists from water organisations and BWO's for permanent analysis of situation and proposals preparation to leadership for decision making.

4. To develop state plan of action on low water supply overcoming foreseing:

- water losses cut down, including canals lining, field non-flooding and irrigation water releases in open collectors;
- efficient and rational water use;
- accounting of available water resources including attraction of local rivers, ground and drainage waters;
- correction of leaching scheduling with purpose of water saving;
- introduction of more efficient irrigation norms for major crops and leaching norms according to crops biological demand;
- transition to improved methods and technique of irrigation (short furrows, concentrated jet, due leveling, etc).

5. Before growing season to calibrate gauging stations and hydrostructures, to install measuring devices.

6. To provide free access of BWO representatives to all gauging stations independently of their ownership for control measurements with participation of sides of interest. To transfer water measurements in main canals head structures on Amu Darya river (Tashauz Branch, LBK, PBK) under BWO "Amu Darya" supervision.

7. To provide timely and sufficient funding for repair and rehabilitation of canals and structures under BWO's supervision by the Ministries of Finance of the Central Asian States.

8. To provide free boundaries crossing by BWO representations carrying loads, technics and equipment which is necessary for fulfillment of works on hydrostructures.

9. To complete in current year cleaning of leading canal to Makhram pumping station and provide the Kairakkum reservoir full useful volume utilization increasing its complementarily on 800 mln. m^3.

10. To ask IFAS to find financial means in amount of USD 50 th. for water accounting supplied from the Naryn hydropower cascade to the Syr Darya river's structures system managed by BWO "Syr Darya". Special technical means should be installed for radio and telemetric control which permits to manage water allocation and control water intake structures of the canals LNK, BNK, BFK and Uchkurgan and also Uchkurgan hydropower and obtain continuous information about discharges measured by gauging station "Uchkurgan".

11. To approve the mechanism of water resources allocation under conditions of low water supply in 1998 with regard to actual water use in the middle and lower reaches:

a) If the states follow the parity of water use water allocation in lower reaches is performed according to water-intake shares approved;

b) While calculating water-intake shares to establish quota of water releases to the delta and Aral Sea not less than 50 m^3/sec for Syr Darya and 100 m^3/sec for Amu Darya;

c) Share of each water user (including the Aral Sea) is established every 10 days according to rest of limits approved;

d) In order to increase responsibility of each state to establish BWO's right for water-intake re-regulation making correction of limits within the river sites, i.e. to cut down established limit on overtaken volume).

12. Agricultural and water-managerial bodies should introduct in-farm water rotation and in some cases - intra-farm water rotation.

Appendix N 2
to the question N 2 of the ICWC meeting decision
of February 21, 1998, Ashgabat

Plan of measures
on water accounting improvement in 1998

#	Kind of activity	Date of completion	Responsible	Notes
1	Equipment of Uchkurgan hydropower, gauging station Uchkurgan and head structures of canals ËÍÊ, ÁÍÊ, ÁÔÊ and Uchkurgan by control devices and system of communication allowing to solve tasks of operative management in real time regime, to transfer information and its processing within the structural units.	1998-1999	BWO "Syr Darya" MP "Sigma" AO "Kyrgizenergoholding" Minselvodkhoz of the Kyrgiz Republic Minselvodkhoz of the Republic of Uzbekistan	
2	Installation of gauging stations on low water of Toktogul reservoir near Shamaldisay for control of reliability of releases regime of the Naryn hydropower cascade.	1998-1999	Hydromet of the Kyrgiz Republic Minselvodkhoz of Kyrgizstan AO "Kyrgizenergoholding"	
3	To carry out regularly (2 times a day) measurements on gauging stations Akjar and Kzylkishlak providing timely information transfer to Hodjand		Glavhydromets of Kyrgizstan and Uzbekistan Minvodkhoz of Tadjikistan BWO "Syr Darya"	
4	To provide if necessary BWO "Syr Darya" collaborates free access to information obtained by Hydromets of the Central Asia states on the gauging stations of Syr Darya and its tributaries, to make joint measurements with BWO's representatives		Glavhydromets of Central Asian states Minselkhozs and Minvodkhozs	
5	To carry out permanent control measurements on the gauging stations Chinaz-Syrdarya and Kokbulak to investigate causes of flow losses within the Syr Darya middle reaches		Glavhydromets of Kazakhstan and Uzbekistan, BWO "Syr Darya"	
6	To provide regular BWO "Syr Darya" access to hydromets'		Glavhydromet of Uzbekistan	

#	Kind of activity	Date of completion	Responsible	Notes
	information on the Syr Darya river and its tributary water quality			
7	SIC ICWC together with BWO "Syr Darya" and hydromets of five states to elaborate procedure of joint control of river water horizon and discharge	1998	SIC ICWC BWO "Amu Darya" Uzgidromet Turkmengidromet	Financing is provided by MAWR of Uzbekistan and Turkmenistan in equal share according to cost estimates submitted by SIC ICWC
8	SIC ICWC and BWO "Amu Darya" to submit for ICWC approval linear scheme of Amu Darya with main points of observation using existing gauging stations in the large water-intakes head.	1998	SIC ICWC BWO "Amu Darya" Uzgidromet Turkmengidromet	Financing is provided by MAWR of Uzbekistan and Turkmenistan in equal share according to cost estimates submitted by SIC ICWC
9	BWO "Amu Darya" to set up accounting of observations on approved gauging stations and submit information to MAWR of Uzbekistan and Turkmenistan	1998	BWO "Amu Darya"	
10	To charge provincial operational organizations (Uzbekistan, Turkmenistan) to submit information every ten days to BWO "Amu Darya" about return water coming to the river which is necessary to make reliable river balance.		Ministries of Water Management of Uzbekistan and Turkmenistan	
11	To carry out systematic control measurements on Amu Darya river in order to identify causes of flow losses within the lower and middle reaches		Glavgidromet of Uzbekistan and Turkmenistan	
12	To ask Tadjikgidromet about renewal of measurements on main		Glavgidromet and Minvodkhoz of	

#	Kind of activity	Date of completion	Responsible	Notes
	gauging stations along Kafirnigan, Vakhsh and Pyandj. To restore observation on glacial situation, snow storage within the upper watersheds of Amu Darya basin.		Tadjikistan	
13	To equip water-meters on water reservoirs by calming devices and recorders.		Ministry of Water Resources Management Uzbekistan	
14	To complete construction of horizon recorder in outlet of Tuyamuyun reservoir		MAWR Uzbekistan UETMGU	
15	To carry out researches with following tasks relating to water accounting improvement: organization of systematic survey of water reservoirs; organization of optimal disposal of gauging stations and their equipment; elaboration of the model of daily balance along Darganata - Tuyamuyun site; carrying out attestation and calibration of hydrostructures; carrying out attestation of gauging stations; analysis of reservoir losses and recommendation on their reduction; correction of relationship curves.	1998-1999	MAWR Uzbekistan Minvodkhoz of Turkmenistan SIC ICWC UETMGU SIC ICWC SIC ICWC BWO "Amu Darya" SPA SANIIRI SIC ICWC SIC ICWC	financing provision executing financing executing
16	To carry out systematic control measurements on gauging stations along the derivation canals (LBK, PBK, Tashauz branch, Pitnyak-Arna)		BWO "Amu Darya"	
17	After year completion to carry out joint workshop for collaborates of Glavgidromet of Central Asian states and two BWO's for consideration results and development of common approaches to water accounting improvement		Glavgidromets of Central Asian states BWO "Syr Darya" BWO "Amu Darya"	

ABOUT READINESS OF INTERSTATE SYSTEMS AND STRUCTURES UNDER BWO "SYR DARYA" ADMINISTRATION TO THE GROWING SEASON OF 1998

BWO "Syr Darya" has fulfilled survey of hydrostructures and canals in order to assess their technical status according to BWO order N 34 of October 8, 1997.

Results of this survey allowed to assess hydrostructure and canals readiness to the growing season of 1998.

At present time main repair works are being completed on hydrostructures and canals to provide their workability during the growing season. From total number of hydrostructures (203) 84 % is ready to vegetation on 1.02.1998.

Origin of main damages of hydrostructures is connected with long-term operation and tack of finance for their rehabilitation. For canals BFK and Dustlik rehabilitation big volume of work is needed because canals' profiles do not fit designed values, which leads to rise of losses for filtration and decreasing of canal capacity.

Thus these objects require full reconstruction.

Assessment of interstate structures and systems technical status allow to come to the following conclusions:

1. Interstate systems and structures under provisional administration of BWO "Syr Darya" require repair works to prepare them to the growing season.

2. Capital and current repair of structures fulfilled by BWO "Syr Darya" meet standards of hydrostructure construction and maintenance.

ABOUT READINESS OF INTERSTATE WATER STRUCTURES AND SYSTEMS UNDER PROVISIONAL ADMINISTRATION OF BWO "AMU DARYA" TO THE GROWING SEASON OF 1998

According to the ICWC commission SPA SANIIRI and SIC ICWC together with Minvodkhozs of Turkmenistan, Tadjikistan and Uzbekistan revision of water-related systems of BWO's was carried out.

Survey results with conclusions and recommendations were submitted to the ICWC members and considered at its meeting. BWO out coming from these recommendations is carring out work to eliminate mentioned shortcomings found during this revision.

As is evident from the survey BWO "Syr Darya" fulfilled its obligations related to maintenance of water-related systems.

Nevertheless, because of system operation changes there is short time for repair which is difficult to fulfil. Additional difficulties are created by insufficient financing from the states - ICWC members.

Readiness of interstate systems and structures under BWO provisional administration on 01.02.1998 is satisfactory.

But there are some problems which should be resolved within next few years. If they would not be solved it results in low water supply to the region.

1. It is necessary to reconstruct interstate canals (during nearest ten years).

2. To provide financing of head water-intakes reconstruction.

3. To allocate sufficient financial means by each state for renewal of association's assets (communication, transport, digging technics).

4. To provide conditions for free movement of machinery and resources through state boundaries.

PROCEEDINGS OF THE SIC ICWC BOARD OF DIRECTORS' MEETING

Bishkek March 6, 1998

Board of Directors members:

Dukhovny Victor Abramovich	Director SIC ICWC
Ikramov Rakhimjon Karimovich	Ceneral Director SPA SANIIRI
Kipshakbayev Nariman Kipshakbayevich	Director SIC ICWC Kazakh branch
Kiyashkina Lyudmila Mikhailovna	Director SIC ICWC Kyrgiz branch
Mukhamedjanov Valiakhmet Nuriakhmetovich	Director KazNIIVH
Zemlyannikov Alexander Vladimirovich	Chief Engineer Kazgiprovodkhoz
Sarbayev Tel'man Sarbayevich	Chairman "Kyrgizsuudoboor"
Kulov Kubanichbek Mukhanbetovich	Director Kyrgiz NII irrigation
Makarov Oleg Stepanovich	Director PKTI "Vodavtomatika"
Krokhmal' Victor Petrovich	Deputy Director Turkmengiprovodkhoz
Antonov Vadim Igorevich	Director "Uzvodproekt"

Invited:

Beishekeyev K.K.	Deputy Director Water resources Department, Kyrgiz MAWR
Pernabekov Serik Tungushevich	Advisor EC IFAS
Yakubov Khaldar Egemberdiyevich	Chief consultant SPA SANIIRI
Shapiro Albert Mozelevich	Division Head SIC ICWC
Yudakhin Nikolai Nicolayevich	Department Head Kyrgiz MAWR

Considered:

1. SIC ICWC activity in 1997
2. Establishment of Central Asian Consulting association on water-related and ecological projects "Aral Consult".
3. About ICWC decisions fulfillment of February 21, 1998.

Decided:

To agree with SIC ICWC report and draft plan submitted by SIC ICWC.

1. Participants noted, that during recent years attitude to water-related sector is deteriorated and expressed their concern of its potential decrease. On base of analysis of water-related sector activity it was decided to prepare open aplly to the Presidents of the Central Asian states and ICWC members in order to draw attention to water-related sector's problems.
2. To approve institutional documents about Central Asian Consulting association on water-related and ecological problems "Aral Consult".

3. To accept information about ICWC decision of 21.02.1998 and ask leadership of water-related organisations to pay attention to approved decision on work financing through IFAS implementation.

V.Dukhovny
R. Ikramov
N. Kipshakbayev
V. Mukhamedjanov
A. Zemlyannikov
T. Sarbayev
K. Kulov
O. Makarov
V. Krokhmal'
V. Antonov

MEETING OF WATER COUNCIL OF THE REPUBLIC OF UZBEKISTAN

It is known that Water Council is at the same time the National Committee for irrigation and drainage (UzNCID) of ICID.

Council considers on its meetings actual and important tasks of water development in the republic, touching interests of different branches, problems of limited water resources rational use and land reclamation. As a rule, each meeting includes 2-3 questions one of which is a main question and the report thesis and draft decision are submitted to Water Council members for preliminary consideration. After meeting draft decision is developed according to the comments of official expert and others meeting participants. Specialists and scientists of related directions, NGO and mass-media representatives are invited to the meeting and meeting results are enlightened in newspapers.

In 1997 Water Council meetings were held 4 times. On the 1st meeting of January 22, question was discussed 10.1. "State of interstate water allocation in Amu Darya basin in 1996, measures on rational use of available water resources in its lower reaches". Presentations were made by Head of BWO "Amu Darya" I. Kalandarov, Deputy minister for Agriculture and Water Management of the Republic of Karakalpakstan O.Karimsakov, Deputy Head Water Association of Horezm province K.Khalimbetov.

It was noted that interstate water allocation in Amu Darya basin (the same for Syr Darya) is performed firstly in the history of the Central Asian states by independent interstate entity BWO "Amu Darya" under Supervision of Interstate Water Coordination Commission established in 1992. In spite of short time of its existence, it is able to resolve complex tasks of interstate water allocation under conditions of new independent states relations. It was pointed at the same time that there are some unsolved problems which do not depend on BWO "Amu Darya".

In its decision Council gave certain recommendations and proposals on these problems.

State and shortcomings of rational use of water limits established for the Republic of Karakalpakstan and Horezm province were discussed. Coming out of prospectives of Uzbekistan's water resources state and formation Council recommended to leadership of Karakalpakstan and Horezm province's water-related organisations to establish water saving programme for all water users.

The second meeting considering question 11.1 "Water pricing problems under conditions of Uzbekistan and recommendations on their practical implementation" was held on May 6, 1997. Presentation was made by Prof. V.Dukhovny and Dr. M.Pinkhasov and revised by Dr. F.Kayumov and Dr. Abdusalimov.

In the Council decision on this question it was mentioned that water pricing for different water users with transition to market-oriented economy, especially for agricultural users is necessary and should be implemented. Scientific-research institutes and organisations developed theoretical approaches and practical experience in water-pricing in Bekabad district of Tashkent province.

Council recommended to Minselvodkhoz together with scientific-research and design institutes to prepare the package of documents for experiment performing in 2-3 districts of the Republic. It is proposed to create working group of specialists from the Ministry, SPA SANIIRI, SIC ICWC and others and make open discussion of this question in mass-media.

On July 17 Council has discussed question 12.1 "Problems of agroforestry reclamation un the Aral Sea adjacent areas and sea desiccated bottom and tasks of planned measures implementation". Presentation was prepared by State Committee for Forestry of the Republic of Uzbekistan. It was followed by 20 minutes telefilm about current situation of landscape and measures being already undertaken. Presentation was made by Council member, First Deputy Chairman of Forestry Committee Sh. Yusupov.

Council in its decision on this question mentioned that main cause of sharp sea horizon lowering is ecologically and economically ungrounded water use increase within the Aral Sea basin. Since 1960 during 35-36 years sea horizon lowered on 15.5 m, its volume decreased by 5 times, aquatic surface reduced by 2 times, water salinity rised by 3 times and now is equal to 31-32 g/l. At present time sea area is 3.5 mln. ha from which 1,8 mln ha belongs to Uzbekistan. Windstorms almost daily withdraw from dry bottom together with sand and dust toxic chemicals-fertilizers, pesticides which are transported all over the basin and outside of it.

Council affirmed that one of main ways to prevent desiccated bed desertification is its planting by saksaul, bushes and perennial grass.

It is recommended to the Committee of Forestry together with the Cabinet of Ministries of the Republic of Karakalpakstan to prepare all necessary data (design, economic and others) for this question consideration by Cabinet of Ministries of the Republic of Uzbekistan.

The fourth Council meeting was dedicated to the question 13.1 "Problems of energy saving in the system of machinery water lift of Minselvodkhoz and recommendations on their solution." Presentation was made by SPA SANIIRI Deputy Director Sh.Rakhimov, as an expert was appointed Dr. T.Kamalov.

The Council is decision has underlined, that more than 47 bln. kvt.h of electric energy is produced annually in Uzbekistan from which 8 bln. kvt.h is spent for water pumping stations which constitutes more than half all financial expenditures of Minselvodkhoz allocated by state for reclamation system of Uzbekistan maintenance. In section 3 13 perspective directions are listed for scientific and technical development of energy saving measures with subsequent implementation on middle and large pumping stations of Minselvodkhoz.

The law "About energy saving in the Republic of Uzbekistan" is being prepared which is under Consideration of Oliy Majlis (Parliament of the Republic of Uzbekistan).

Along with above mentioned measures National Committee for irrigation and drainage disseminates publications and scientific magazines, issued by ICID (news update, newsletter, annual reports, etc), ICID international conferences proceedings. On occasion of International Water Day special issues are being prepared, assistance is given to Water Councils in the Republic provinces. These councils simultaneously are collective members of NCID. Transition of some materials from news update, newsletter and others in Russian to these organisations is planned.

NCID participates in preparation of the candidates for ICID activity. First Deputy Minister of Minselvodkhoz A.Djalalov has taken part in ICID Executive Committee meeting and 19 th European regional conference in Oxford on 8-14 th of September, 1997.

As a conclusion it is worth to note, that NCID collaboration with ICID and the National Committees of other countries is difficult because of language barrier (there are few specialists with foreign language proficiency) and financial problems related to specialists' travels abroad.

ABOUT NORTHERN ARAL SEA

One of the concrete measures of the Program of the Aral Sea saving which is adopted by the Heads of state of Central Asia is creation of the Northern sea (Small Aral).

Lot of scientific and design researches including "Regional Water Strategy" development permit to consider the task of the Aral sea stabilization as achievable. It is possible to stop its desiccation, river deltas' degradation and to improve water management system. The main task is all kinds water saving in sphere of its use and improvement of its management.

To make free 5-7 cu. km water within the Syr Darya river basin (from 45-50 cu. km used in economy) is a real task and its resolution would allow to stop environment deterioration and other adverse processes.

Nevertheless, obtaining additional discharge for the Syr Darya lower reaches is insufficient for problem's solution. Set of engineering-technical measures is necessary for reasonable water use particularly Syr Darya channel reconstruction, water losses reduction for flooding and, finally, Small Aral transformation into regulated independent water body.

During last 5 years because of natural separation of Smal Aral from Big one and created difference in horizons (up to 3 m) overflow from Small Aral to the Big one was occurred. As a result Small Aral is continuing to desiccate giving water to the Big one without any benefit to the last. Besides, under overflow sub-surface bar is being washed out which leads to partition of the Small Aral into separate lakes.

Only possibility to prevent its vanishing is its separation from the Big Aral by the Kakaral dam in the Berg strait. Works on the Small sea creation were started in 1992 under initiative of the State Committee for Water Resources of the Republic of Kazakhstan by development of pioneer dam of small height to stop overflow and keep sea horizon.

But because of lack of finance construction has being performed very slowly (1993-1997) and as a result this dam was washed out twice by flood and waves.

After including the Small Sea project into the "Program of concrete actions" this object obtained necessary regional status and more serious ground of this measure became necessary. Decision was made on development together with the World Bank feasibility study for Northern Sea with subsequent construction at expense of credits. In 1997 German-French firm "Cessogrea" together with Kazgiprovodkhoz started this feasibility study.

The following main criteria were accepted for its creation and reconstruction:

1. Creation of the Northern Sea is considered as a part of common problem of the Aral Sea saving with purpose of mitigating of ecological crisis consequences and improvement of social-economic conditions in the Aral Sea adjacent area.

2. Aquatic surface area and planned sea horizon should be dictated by guaranteed water supply, minimum ecological requirements, and social-economic efficiency of created water body.

3. Maximum approximation of aquatic surface to settlements. Particularly, creation of stable aquatic surface around Aralck city is one of the most important effects of the Northern Sea.

4. Created water body on water quality should meet purposes of its fishery meaning rehabilitation. It should not be transformed into evaporation sink of the Syr Darya basin. From this point of view it is necessary to provide minimum conditions for water flow and water desalinization. Fishery requires not only aquatic surface enlargement, but creation of appropriate depth for fish-breeding.

5. Considered structures' design should not prevent perspective solution of the Big Aral Fortune.

Within the Main Provisions of the Regional Water Strategy of the Aral sea basin (phase 1, 1996) preliminary limits are established for water releases from Syr Darya to the sea under 90 % water supply provision in amount of 3.5 km^3/year, in an average water supply year - 6.0 km^3/year.

Different schemes of the Northern sea aquatic surface reconstruction are available under mentioned diapason of water supply, permitting to meet most of above requirements. Most acceptable from them is as follow.

To keep water body in the central part of the Small sea with preliminary selected altitude +43.0 m with subsequent achievement of +45 m by means of creation a dam in the Berg strait and construction of spillway. In northern part of Sarishiganak bay near Aralsk the city recreation pool is established with the horizon 49-50 m (volume is 70-80 mln.cu.m), supplied through special canal with capacity 10 m^3/sec from Syr Darya river or Kamislibas lake. This canal is also used for Aralsk water supply.

The Small sea horizon stabilizing and rising by the dam in the Berg strait will allow to cover with water up to 30 % of desiccated bottom of the Aral northern part and due to depth increase and salinity reduction will allow to restore fish-breeding, to decrease dust withdrawal to the atmosphere, to improve employment of local population (fishery, fish processing, boat repair, services) and to provide the region with fish production. Besides, this will allow to create green zone around Aralsk and provide Aral side population by orchard and farming plots, to improve micro-climate and to provide more comfortable environment.

Address:
SIC ICWC,
11, Karasu-4, Tashkent,
700187, Uzbekistan

Order № 16 (17.08.98)

Printed in SIC ICWC