Interstate Coordination Water Commission of Central Asia

BULLETIN No. 17

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CONTENTS

TASHKENT DECLARATION ON THE UN SPECIAL PROGRAM FOR CENTRAL ASIAN ECONOMIES

Tashkent March 26, 1998

The Republic of Kazakhstan, the Kyrgyz Republic, the Republic of Tadjikistan, Republic of Uzbekistan, from one hand, and UN European Economic Commission and UN Economic and Social Commission for Asia and Pacific (ESCATO) from other hand,

admit the necessity of further strengthening of economic relations among the Central Asian states and economic integration of Central Asian region's states with Europe and Asia,

basing on the above mentioned, they intend to adopt the UN Special Program (SPECA) for Central Asian economies and begin its fulfillment.

The Program's goal is to extend the Central Asian states mutual collaboration, to stimulate their economic development and integration into the European and Asian countries' economies.

The Program will be fulfilled on the principles of the collaboration and mutual benefit, the transparency and equality of Central Asian states-participants. The Program will be supported by the donors-countries and international organizations.

Within the first phase of the Program the main aspects of the elaboration are:

development of the transport infrastructure and the simplification of the procedures for the goods, services and people to cross the state borders;

rational and efficient Central Asia power and water resources' use;

international economic conference in Tadjikistan, dedicated to the region development's joint strategy and foreign investments attraction;

the region collaboration on the points of the multivariant ways of hydrocarbon raw materials delivery through the pipelines to the world markets. The list of the collaboration aspects may be extent by the mutual consent of the sides.

Central Asia states and UN regional commissions appeal to another UN development system organizations and establishments, supporting the states, donors-countries and international financial organizations and also private sector to finance and support the UN special program.

To fulfill the Program as soon as possible the SPECA states-participants' governments jointly with EEC and ESCATO and also UN residents-coordinators in the proper states will develop and coordinate the Program's institutional structure, determine the main mechanisms of its financing and fulfillment principles.

SPECA state-participants are grateful to UN General Secretary Cofy Annan for the Central Asia states' initiative support and UN system re-

sources mobilization for these purposes.

For the Republic of Kazakhstan
For the Kyrgyz Republic
For the Republic of Tadjikistan
For the Republic of Uzbekistan
For the UN European Economic Commission
For the UN Economic Special Commission
for Asia and Pacific ocean countries

THE TURKMENISTAN PRESIDENT'S DECREE

«On establishing of the Ministry of Agriculture and Water Management»

To establish the Ministry of Agriculture and Water Management of Turkmenistan abolishing the Ministry of Agriculture and Ministry of Reclamation and Water Resources of Turkmenistan.

Turkmenistan's President Saparmurat Turkmenbashy

July 17, 1998

APPOINTMENTS

THE TURKMENISTAN PRESIDENT'S DECREE

«About K.M.Velmuradov»

To appoint Mr. Kurban M. Velmuradov to the post of the Minister of Agriculture and Water Management of Turkmenistan, dismissing him from the obligations of the Chairman of the Association of the joint-stock companies on the technical and agrochemical service of the agriculture "Turkmenobakhyzmat".

Turkmenistan's President Saparmurat Turkmenbashy

July 17, 1998

KURBAN M. VELMURADOV

He was born in 1955 in Ashkhabad. He is Turkmen in nationality. In 1990 he has graduated from the Turkmen Agrikultural Institute. In 1976 he began to work as a technician of Ashoblispolkom Department of Internal Affairs. In 1977-1981 he served in the Soviet Army. After he has finished his service, Mr. Velmuradov worked as an Engineer, then as a Chief-engineer in "Goskomselkhoztechnika" of Turkmenistan. Since 1982 till 1986 he was the Senior Engineer, the Procurement Department Head in Minvodkhoz of Turkmenistan. Since 1986 till 1988 he was the Department Chief-engineer, Deputy Head of Glavagrosnab of Gosagroprom in Turkmenistan. In 1988-1990 Mr. Velmuradov has been working as a Deputy General Director and the First Deputy Director of "Turkmenagropromsnab". Since 1990 till 1992 he is the Department Head, the Deputy General Director of "Turkmenagropromsnab", since 1992 till 1993 – the Deputy Chairman of State Corporation "Turkmenselkhozpromservice", since 1993 till 1995 – the Head of Financial-

Technical Provision Department of Minselkhozprom of Turkmenistan. In 1995 he worked as a Deputy Chairman, Acting Chairman of “Selservice” Association, in 1996 – the Deputy Minister of Agriculture – the Chairman of “Selservice” Association. In the same year Mr. Velmuradov was appointed as Acting Chairman of Association of the joint-stock companies on the technical and agrochemical services the agriculture “Turkmen-obakhyzmat”.

He was rewarded with the medals “For The Love To Motherland” and “Gairat”.

PROCEEDING # 19
of the Interstate Coordination Water Commission's (ICWC) Meeting
of the Republic of Kazakhstan, the Kyrgyz Republic, the Republic of Tadjikistan,
Turkmenistan and the Republic of Uzbekistan

Shymkent May 15, 1998

Attendees:
ICWC Members

T.T.Sarsembekov	Chairman of the Committee of Water Resources of the Republic of Kazakhstan
A.V.Kostyuk	First Deputy Chief of the Water Department of the Ministry of Agriculture and Water Management of the Kyrgyz Republic
D.M.Maksudov	Minister of Reclamation and Water Management of the Republic of Tadjikistan
T.A.Altiyev	Deputy Minister of Reclamation and Water Management of Turkmenistan
A.A.Jalalov	Deputy Minister of Agriculture and Water Management of the Republic of Uzbekistan

ICWC Honorary Members

R.A.Giniyatullin	EC IFAS Chairman
N.K.Kipshakbayev	SIC ICWC Kazakh Branch Director

ICWC Organizations

I.J.Kalandarov	BWO "AmuDarya" Head
O.G.Lysenko	BWO "AmuDarya" Water Resources Department Head
M.M.Khamidov	BWO "SyrDarya" Head
A.I.Leshansky	BWO "SyrDarya" Water Distribution and Water Balances Department Head
V.A.Dukhovny	SIC ICWC Director
G.A.Negmatov	ICWC Secretariat Head

Invited

K.A.Abdullayev	South-Kazakhstan region Akim
S.O.Turbekov	South-Kazakhstan region Deputy Akim
R.S.Khalmuradov	Council Secretary for the South-Kazakhstan region Sustainable Development Council
I.T.Tursynkulov	South-Kazakhstan region Administration Department Head
A.K.Kudjanov	Head of the Kzyl Orda Provincial Committee for Water Resources of the Republic of Kazakhstan
K.P.Polatov	Head of the South-Kazakhstan Provincial Committee for

	Water Resources of the Republic of Kazakhstan
A.A.Pridatkin	"Power" Joint Direction Director
B.I.Pedan	Head of Central Control Services AS "Kyrgyzenergo"
A.K.Nauryzbayev	President of AS "Kegok"
K.D.Dukenbayev	Vice-president of AS "Kegok"
D.G.Goshayev	Head of the Operation Department of Minvodkhoz of Turkmenistan
Yu.I.Sokolsky	Head of Department of Scientific-Technical and Water Resources of the Republic of Tadjikistan
B.M.Yusupov	Head of Department of Water Resources Balance of the Republic of Uzbekistan

Chairman is T.T.Sarsembekov – Chairman of the Committee of Water Resources of the Republic of Kazakhstan

AGENDA

1. The results of the non-growing period of 1997-1998 and the clarification of the water reservoirs' cascade operation regime and the water intake limits in AmuDarya river basin for the growing period of 1998 (Responsible: BWO "AmuDarya" and BWO "SyrDarya").
2. The report on the works on the complex use and Aral Sea basin's water resources protection information system's development and the main points on the information exchange (Responsible: SIC ICWC).
3. About giving the international status to BWO "AmuDarya" and BWO "SyrDarya" (Responsible: BWO "AmuDarya" and BWO "SyrDarya").
4. An additional point "The main goals and aspects of the Aral Sea basin's water resources rational use strategy" enclosed according to the EC IFAS Administration's decision of March 12, 1998.

After the meeting participant's presentations have been heard and opinions exchange has been executed ICWC members have decided:

ON THE FIRST QUESTION

1. To take into consideration BWO "AmuDarya" and BWO "SyrDarya" measures on the water intake limits' fulfillment and reservoirs' operation cascade regime provision on AmuDarya and SyrDarya rivers for the non-growing period of 1997-1998.
2. To approve the precised water intake limits from AmuDarya and SyrDarya rivers and also the reservoirs' operation cascade regime for a growing period of 1998 and water supply volumes for Aral Sea and the Aral coastal zone (See Appendix I).
3. To accept AS "Kegok" President Mr. A.Nauryzbayev's announcement of the fulfillment of coal and power delivery and power acceptance volumes, determined by the interstate Agreement of March 17, 1998. These volumes will allow to supply the middle and lower reaches of SyrDarya river including Dustlik canal as well as the Chardara inflow in accordance with the regime, approved by the ICWC for the current growing period.

ON THE SECOND QUESTION

1. To note that ICWC organizations' members – SIC ICWC, BWO "AmuDarya" and BWO "SyrDarya" have fulfilled the considerable work on the first phase of the data base creation, its centers' initial equipment, common coordinated approaches development, however at the present time the data base is not completed and not prepared for solution of the most important tasks of efficient management and the perspective planning.

2. To take into account that the "Agreement between the Republic of Kazakhstan, the Kyrgyz Republic, the Republic of Tadjikistan, Turkmenistan and the Republic of Uzbekistan on the information exchange for Aral Sea basin's water resources use and protection" is not yet completed.

To complete the Agreement's text it is necessary to create the working group, which includes every ICWC member's representative with the Ministry's comments till June 1, 1998.

3. To ask ICWC members to finance ABP development, at the first turn to check the data and prepare it for the system's first line exploitation and also to finish completion of information centers' national stuff.

4. To accept EC IFAS Chairman (Mr. Giniyatullin) announcement of the working group's financing for EC IFAS expense.

ON THE THIRD QUESTION

1. To ask ICWC members through of their governments to support approval of "Agreement between the Republic of Kazakhstan, the Kyrgyz Republic, the Republic of Tadjikistan, Turkmenistan and the Republic of Uzbekistan on the Status of International Fund of Aral saving and its organizations" by the heads of states.

2. For BWO "AmuDarya" and BWO "SyrDarya" to bring in the proper changes into the organizations' rules and submit draft rules for the consideration and approval.

ON THE ADDITIONAL QUESTION

1. To note that during last years in the region as a whole attention to the water resources saving is weakened.

2. For ICWC members to take additional measures on the water resources productivity rise and specific water consumption reduction.

Agenda of the next 20-th ICWC Meeting in Kyrgyz Republic, July, 1998

1. About growing period irrigation execution of the current year and additional measures on its successful completion.

2. About interstate water structures and objects' technical state and necessary measures in relation with current high flow in 1998.

3. The consideration of the project "Agreement on information exchange of the or-

ganizations, managing the Aral Sea basin's water and land resources use".

4. About the next ICWC Meeting agenda.

FOR THE REPUBLIC OF KAZAKHSTAN	T.T.SARSEMBEKOV
FOR THE KYRGYZ REPUBLIC	A.V.KOSTYUK
FOR THE REPUBLIC OF TADJIKISTAN	D.M.MAKSUDOV
FOR TURKMENISTAN	T.A.ALTIYEV
FOR THE REPUBLIC OF UZBEKISTAN	A.A.JALALOV

Appendix 1
To ICWC Meeting proceeding
of May 15, 1998, Shymkent

The intake limits from AmuDarya and SyrDarya rivers and water supply limits to the Aral Sea and rivers' deltas for 1997-1998

River basin, state	Intake limits, km^3	
	Total for the year (since 1.10.97 till 1.10.98)	Including for the growing period (since 1.04.98 till 1.10.98)
The total from SyrDarya river including:	21,57	18,50
The Republic of Uzbekistan	11,15	8,80
The Republic of Kazakhstan	8,20	7,70
The Kyrgyz Republic	0,22	0,20
The Republic of Tadjikistan	2,00	1,80
Besides that:		
Water supply into the Aral Sea	3,00	1,00
The total from AmuDarya river including:	52,350	38,379
The Republic of Tadjikistan	8,170	6,199
The Kyrgyz Republic	0,180	0,180
From AmuDarya river to the Kerki gauging station	44,000	32,000
Turkmenistan	22,000,	16,000
The Republic of Uzbekistan	22,000	16,000
Besides that: water supply into Aral Sea	4,500	3,000
Coastal zone taking into account irrigation releases and collector-drainage water		
Sanitary-ecological water releases into the irrigation systems:	0,800,	
Dashkhovuz veloyat	0,150	
Khorezm veloyat	0,150	
The Republic of Karakalpakstan	0,500	
The total in Aral Sea and Aral Coastal area	7,500	4,000

Remarks. 1. The water intake limits suppose water supply for irrigation, industrial-domestic and other needs. The water intake limits will be corrected respectively to the basin water supply changes.

2. The whole volume will be directed into the Aral Sea under the AmuDarya river water volume increase.

ICWC Proceeding Decision

May 15, 1998 Shymkent

About BWO “AmuDarya” and BWO “SyrDarya” financing

1. To note that in relation with the economic reforms in Central Asian states, their annual financing for BWO maintenance given by these states, are not sufficient to provide guaranteed technical state of unique structures and irrigation systems which are under the BWO’s provisional administration.

2. To ask ICWC members to finance BWO according with the water intakes shares from the river’s basins.

3. BWO should provide an effective use of Central Asian states finances to support the objects given for their provisional administration.

FOR THE REPUBLIC OF KAZAKHSTAN	T.T.SARSEMBEKOV
FOR THE KYRGYZ REPUBLIC	A.V.KOSTYUK
FOR THE REPUBLIC OF TADJIKISTAN	D.M.MAKSUDOV
FOR TURKMENISTAN	T.A.ALTIYEV
FOR THE REPUBLIC OF UZBEKISTAN	A.A.JALALOV

THE RESULTS OF THE NON-GROWING PERIOD OF 1997-1998 AND PERFECTIONING OF THE WATER RESERVOIRES' CASCADE OPERATION REGIME AND THE WATER INTAKE LIMITS IN THE AMUDARYA RIVER BASIN FOR THE GROWING PERIOD OF 1998[1]

AmuDarya river basin's weather conditions have brought their amendments in the non-growing period of 1997-1998. Accepted by ICWC members non-growing period's water strategy was entirely successful. As the result, at the beginning of the growing period optimum water storage in Tuyamuyun reservoir was created and the growing period as a whole was successfully carried out. The main water users did not present any pretensions or remarks to the BWO's.

In the 3rd decade of February in the river lower reaches an extreme situation on the high discharges' passing along the river trunk has happened under the enough difficult ice conditions. In this period to avoid emergency situation on the river and its unloading water users of lower reaches were forced to increase water intake limits in the canal systems and make water unproductive releases.

The results of the established water intake limits use analysis for the non-growing period in every state are the following:

1. The Republic of Tadjikistan established limits were used on 93,8 %: under the limit 2100 mln. cu. m, in fact it was used 1970.7 mln. cu. m; last year it was used 2081.9 mln.cu.m (the lag in the current growing period is 111.2 mln. cu. m).

2. The Republic of Uzbekistan established limit was used on 100,7 %: under the limit 5965 mln. cu. m in fact 6009 mln. cu. m were used or 633.1 mln. cu. m less than last year (6642.1 mln. cu. m in 1997).

3. The Turkmenistan established limit was used on 95.8 %. Under the limit 6000 mln. cu. m in fact it was used 5745.4 mln. cu. m, what was 743.5 mln. cu. m less than last year.

Established intake limits used in every river section are the following:

1. The upper reaches - 93,8 %.

2. The middle reaches - 105,3 %, including the Republic of Uzbekistan - 119,1 %, Turkmenistan - 96,0 %.

3. The lower reaches - 85,6 %, including the Republic of Uzbekistan - 81,3 %, Turkmenistan - 94,9 %.

Disproportion in the water use levels between middle and lower reaches reflects an adopted coordinated strategy of water supply of river basin's states-water users.

Due to measures undertaken on April 1, 1998 the Tuyumuyun reservoir's water volume was equal to 5425 mln. cu. m or 1393 mln. cu. m more than the last year on this date.

[1] Information on the first question of the ICWC Meeting Agenda

Nurek reservoir's water volume on April 1, 1998 was equal to 5879 mln. cu. m, on April 1, 1997 was equal to 5787 mln. cu. m or 108.0 mln. cu. m less than this year.

At the beginning of the growing period the water volume on the in-system reservoirs equals 5.31 cu. km, at last year it was equal 3.96 cu. km. On April 1, 1998 water resources in these reservoirs were managed to increase on 1.35cu.km.

The schedule of the water supply to the Aral Sea during the non-growing period was fulfilled on 119.3 %. Under the schedule 1500 mln. cu. m 1790 mln. cu. m were supplied, in 1997 2899 mln. cu. m were supplied during the same period.

For the reported period the established limit on the sanitary releases was used on 91.3%, including: Khorezm – 45.4 %, Dashkhovuz – 108.1 %, the Republic of Karakalpakstan – 100 %.

Beside that, in relation with the compulsory increased water releases in the lower reaches the emergency-ecological water releases' volumes were equal 278.7 mln. cu. m, including: the Republic of Karakalpakstan – 165 mln. cu. m, Dashkhovuz – 113.7 mln. cu. m.

The actual water supply during the non-growing period turned out higher then expected. So, the river flow on Kerki gauging station upstream Karakum canal was equal 16.2 cu. km or 112 % of the norm (14.4 cu. km).

An expected water supply for the growing period according to Uzgidromet's data is equal on average 106 % of the norm or 50.6 cu. km.

Initial conditions for the growing period of 1998 overcoming (the real water resources in reservoirs; the water supply forecast; the weather conditions) create all premises for its successful carrying out.

On the base of above mentioned BWO "AmuDarya" developed the reservoirs cascade operation and water intakes regimes in AmuDarya river basin, which were presented to ICWC members.

In conclusion BWO "AmuDarya" offers:

1. To approve BWO "AmuDarya" report on the water intake established limits use for the non-growing period of 1997-1998.

2. To allow (under the necessity) water users to use saved by them limits in the non-growing period during the determined period of the growing season.

3. To approve presented by BWO "AmuDarya" the reservoirs cascade operation regimes and water intake limits in AmuDarya river basin on the growing period of 1998.

THE INFORMATION
of the timely and without delays water supply of all water users
according to the established limits and water supply schedules on AmuDarya river
for the period since October 1, 1997 till April 1, 1998 (mln. cu. m)

State, province, water intake	For the non-growing period of 1997-1998 (October, November, December)			For the non-growing period of 1997-1998 (January, February, March)			The total for the non-growing period of 1997-1998			The per-cent of use
	limit	open limit	fact	limit	open limit	fact	limit	open limit	fact	
TURKMENISTAN – THE TOTAL	1998.8	2161.8	2161.8	4001.2	3838.2	3583.6	6000	6000	5745	95.7
Karakum canal	1625.6	1639	1639	1808.4	1795	1680.5	3434	3434	3319.5	96.6
Lebap vel. – total:	373.2	410.2	410.2	801.8	764.8	695.6	1175	1175	1105.8	94.1
From them: Berzen	65	72.5	72.5	141	147.5	134.7	206	220	207.2	94.1
Kul-Aryk	75.5	80.7	80.7	151.5	149.3	122.3	227	230	203	88.26
Shykh-Bityk	27.3	30.1	30.1	46.7	46.9	44.8	74	77	74.9	97.2
Sayat-Naukhana	65.8	71.4	71.4	122.2	113.6	108.9	188	185	180.3	97.45
Karabekaul	29	29.9	29.9	56	60.1	59.6	85	90	89.5	99.44
Esen-Mengly	15.9	12.4	12.4	41.1	33.6	30.2	57	46	42.6	92.6
Khodjambas	28.1	36.8	36.8	51.9	48.2	45.4	80	85	82.2	96.7
V.Chorshanga	30.6	36.9	36.9	73.4	53.1	50.9	104	90	87.8	97.55
By pumps from river	20.2	23.8	23.8	88.8	97.2	96.8	109	121	120.6	99.66
From KMK	15.8	15.7	15.7	29.2	15.3	2	45	31	17.7	57.09
Dashkhovuz vel. – total:	0	112.6	112.6	1391	1278.4	1207.5	1391	1391	1320.1	94.9
Including: Khan-Yab	-	109.1	109.1	531	474.9	474.9	531	584	584	100
Djumbay-Sakha	-	-	-	45	36	34.4	45	36	34.4	95.55
Upradik - total	0	3.5	3.5	815	767.5	698.2	815	771	701.7	91.01
Including Klychbay	-	-	-	155	170	168	155	170	168	98.82
Gazavat	-	-	-	197	175	165.1	197	175	165.1	94.34
Shavat	-	-	-	390	370	327.2	390	370	327.2	88.43

State, province, water intake	For the non-growing period of 1997-1998 (October, November, December)			For the non-growing period of 1997-1998 (January, February, March)			The total for the non-growing period of 1997-1998			The per-cent of use
	limit	open limit	fact	limit	open limit	fact	limit	open limit	fact	
Kypchak-Bozsu	-	-	-	6	6	6.1	6	6	6.1	101.6
Tashauz branch	-	3.5	3.5	67	46.5	31.8	67	50	35.3	70.6
Beside that, sanitary releases	150	150	162.2	-	-	-	150	150	162.2	108.1
Emergency-ecological water releases	-	-	-	-	-	113.7	0	0	113.7	-
UZBEKISTAN – THE TOTAL	2265.7	2178.5	2178.5	3699.3	4373.5	3830.5	5965	6552	6009	91.71
Karshy canal	971.1	1024.1	1024.1	728.9	997.9	998.5	1700	2022	2022.6	100
Amubukhara canal	455.9	759.8	759.8	924.1	885.2	885.9	1380	1645	1645.7	100
Khorezm province – total	95	151.1	151.1	1140	1083.9	773.9	1235	1235	925	74.89
Including: Upradik – total	95	151.1	151.1	1140	1083.9	773.9	1235	1235	925	74.89
From them: Tashsaka	83.8	125.4	125.4	823.2	806.6	553.9	907	932	679.3	72.88
Klychbay	9.5	22.5	22.5	109.5	77.5	55.7	119	100	78.2	78.2
Urgench-Arna	-	-	-	43	30	23	43	30	23	76.66
Oktyabr-Arna	-	-	-	96	96	78.2	96	96	78.2	81.45
By pumps from river	-	-	-	58	58	52.1	58	58	52.1	89.82
Pitnyak-Arna	1.07	3.02	3.2	10.3	15.8	11	12	19	14.2	74.43
Watertube	-	-	-	-	-	-	0	0	0	-
Beside that sanitary releases	51.6	52.9	52.9	98.4	97.1	15.03	150	150	68.2	45.5
KARAKALPAKSTAN - THE TOTAL	743.7	243.5	243.5	906.3	1406.5	1172.2	1650	1650	1415.7	85.8
Including: Kyzketken	162.3	50.9	50.9	297.7	409.1	302.5	460	460	353.4	76.82
Bozatau	85.5	40.3	40.3	49.5	89.7	57.4	135	130	97.7	75.15
Suenpi	64.8	17.2	17.2	123.2	170.3	142.4	188	188	159.6	84.89
Parallelny	65.2	0.7	0.7	110.8	166.3	142.3	176	167	143	85.62
HPS	63.6	13.8	13.08	62.4	42.2	34.1	126	56	47.9	85.53

State, province, water intake	For the non-growing period of 1997-1998 (October, November, December)			For the non-growing period of 1997-1998 (January, February, March)			The total for the non-growing period of 1997-1998			The per-cent of use
	limit	open limit	fact	limit	open limit	fact	limit	open limit	fact	
Pumps lower Kipchak	27.9	0.8	0.8	21.1	27.2	21.5	49	28	22.03	79.64
Drinking and technical needs	-	5.6	5.6	-	6.4	5.4	0	12	11	91.66
Upradik – the total	274.4	114.2	114.2	241.6	494.8	466.6	516	609	580.8	95.36
From them: Pakhta-Aral	116.9	91.9	91.9	117.1	235.1	235.4	234	327	327.3	100.1
Klychbay	47.5	12.2	12.2	46.5	71.8	64.7	94	84	76.9	91.54
Kipchak-Bozsu	10.5	1.7	1.7	9.5	28.3	21.6	20	30	23.03	77.66
Pumps till g/s Kipchak	99.5	8.4	8.4	68.5	159.3	144.9	168	168	153.3	91.25
Beside that sanitary releases	326.6	234.9	234.9	173.4	265.1	265.1	500	500	500	100
Emergency-ecological water releases	-	-	-	-	-	165	0	0	165	-
THE TOTAL FROM AMUDARYA RIVER	4264.5	4340.3	4340.3	7700.5	8211.7	7414.1	11965	12552	11754	93.64
Beside that: Surkhandarya province	132.1	233.9	233.9	67.9	36.1	35.7	200	270	269.6	99.85
TADJIKISTAN - THE TOTAL	1473.6	1430.4	1430.4	626.4	669.6	540.3	2100	2100	1970.7	93.84
Pyandj river	163.3	242	242	91.7	13	0	255	255	242	94.9
Including Dekhkababad	133.4	200.3	200.3	76.6	9.7	-	210	210	200.3	95.38
Khalkayar	29.9	41.7	41.7	15.1	3.3	-	45	45	41.7	92.66
Other water intakes	-	-	-	-	-	-	0	0	0	
Vakhsh river	1208.2	1054	1054	496.8	651	540.3	1705	1705	1594.3	93.5
Including Yavan-Obikiy MK	54.6	83.3	83.3	45.4	16.7	13.4	100	100	96.7	96.7
Vakhsh MK	1037	865.1	865.1	433	604.9	503.9	1470	1470	1369	93.12
Drifting MK	19.4	16.8	16.8	0.6	3.2	-	20	20	16.08	84
Shurabad MK	89.2	73.8	73.8	10.8	26.2	23	100	100	96.8	96.8
P/st. Garaut MK	8	15	15	7	-	-	15	15	15	100

State, province, water intake	For the non-growing period of 1997-1998 (October, November, December)			For the non-growing period of 1997-1998 (January, February, March)			The total for the non-growing period of 1997-1998			The per-cent of use
	limit	open limit	fact	limit	open limit	fact	limit	open limit	fact	
Other water intakes	-	-	-	-	-	-	0	0	0	-
Kafirnigan river	102.1	134.4	134.4	37.9	5.6	0	140	140	134.4	96
Including BMK	65.6	71.7	71.7	9.4	3.3	-	75	75	71.7	95.6
KMK	36.5	62.7	62.7	28.5	2.3	-	65	65	62.7	96.46
THE TOTAL FROM RIVER BASIN:	5870.2	6004.6	6004.6	8394.8	8917.4	7990.1	14265	14922	13994	93.78

THE INFORMATION
of the timely and without delays water supply of all water users
according to the established limits and water supply schedules on AmuDarya river
for the period since October 1, 1997 till April 1, 1998 (mln.cu.m)

State, province, water intake	For the non-growing period of 1997-1998 (October, November, December)			For the non-growing period of 1997-1998 (January, February, March)			The total for the non-growing period of 1997-1998			The percent of use
	limit	open limit	fact	limit	open limit	fact	limit	open limit	fact	
TURKMENISTAN – THE TOTAL	1998.8	2161.8	2161.8	4001.2	3838.2	3583.6	6000	6000	5745.4	95.75
Karakum canal	1625.6	1639	1639	1808.4	1795	1680.5	3434	3434	3319.5	96.66
Lebap velayat – the total	373.2	410.2	410.2	801.8	764.8	695.6	1175	1175	1105.8	94.11
Dashkhovuz velayat – the total	0	112.6	112.6	1391	1278.4	1207.5	1391	1391	1320.1	94.9
Beside that sanitary releases	150	150	162.2	0	0	0	150	150	162.2	108.1
UZBEKISTAN – THE TOTAL	2265.7	2178.5	2178.5	3699.3	4373.5	3830.5	5965	6552	6009	91.71
Karshi canal	971.1	1924.1	1024.1	728.9	997.9	998.5	1700	2022	2022.6	100
Amubukhara canal	455.9	759.8	759.8	924.1	885.2	885.9	1380	1645	1645.7	100
Khorezm province – the total	95	151.1	151.1	1140	1083.9	773.9	1235	1235	925	74.89
Beside that sanitary releases	51.6	52.9	52.9	98.4	97.1	15.3	150	150	68.2	45.46
KARAKALPAKSTAN – THE TOTAL	743.7	243.5	243.5	906.3	1406.5	1172.2	1650	1650	1415.7	85.8
Beside that sanitary releases	326.6	234.9	234.9	173.4	265.1	265.1	500	500	500	100
THE TOTAL FROM AMUDARYA RIVER	4264.5	4340.3	4340.3	7700.5	8211.7	7414.1	11965	12552	11754	93.64
Beside that:										
Surkhandarya province	132.1	233.9	233.9	67.9	36.1	35.7	200	270	269.6	99.85
TADJIKISTAN – THE TOTAL	1473.6	1430.4	1430.4	626.4	669.6	540.3	2100	2100	1970.7	93.84
Pyandj river	163.3	242	242	91.7	13	0	255	255	242	94.9
Vakhsh river	1208.2	1054	1054	496.8	651	540.3	1705	1705	1594.3	93.5
Kafirnigan river	102.1	134.4	134.4	37.9	5.6	0	140	140	134.4	96
THE TOTAL FROM RIVER BASIN	5870.2	6004.6	6004.6	8394.8	8917.4	7990.1	14265	14922	13994	93.78

The water supply to the Aral Sea
and delta of AmuDarya river during non-growing period of 1997-1998

Name	October	Novem-ber	Decem-ber	January	Fenruary	March	Water supply since1.10.97 till 1.04.98		Percentage of fulfillment
							schedule	fact	
P. Samanbay	83	39	27	27	326	157	1000	659	65,9
Total releases from the Kyzketken and Suenly canal system	49	92	89	26	142	404		802	
Collector-drainage water	47	34	40	43	44	121	500	329	65,8
THE TOTAL	179	165	156	96	512	682	1500	1790	119,3
Increasing	179	344	500	596	1108	1790			

Remark: The data of the water supply in Aral Coastal zone were coordinated with the Glavgidromet of the Republic of Uzbekistan

THE WORK SCHEDULE
of Nurek and Tuyamuyun reservoirs
for the period since October 1997 till March 1998

Nurek reservoir	Unit	Fact						TOTAL
		October	November	December	January	February	March	
Inflow into reservoir	cu.m/sec	331	201	187	180	165	196	3315
Water losses in reservoir	cu.m/sec	-22	-17	-3	20	28	-23	-55
Volume:								
the beginning of the period	mln.cu.m	10540	10180	9437	8467	7300	6280	10540
the end of the period	mln.cu.m	10180	9437	8467	7300	6280	5879	5879
Accumulation (+), release (-)	mln.cu.m	-360	-743	-970	-1167	-1020	-401	-4661
Altitude: the end of period	m	906,91	904,56	888,89	874,75	861,47	855,76	
The water release from reservoir	cu.m/sec	487	505	553	596	559	369	8031

Tuyamuyun reservoir	Unit	Fact						
		October	November	December	January	February	March	
Inflow into reservoir	cu.m/sec	699	633	707	739	840	980	12040
Water losses in reservoir	cu.m/sec	160	182	181	238	49	84	2367
Volume:								
the beginning of the period	mln.cu.m	2682	3413	4182	5093	6091	6435	2682
the end of the period	mln.cu.m	3413	4162	5093	6091	6435	5425	5425
Accumulation (+), release (-)	mln.cu.m	731	769	911	998	344	-1010	-2743
Altitude: the end of period	m	123,34	126,02	128,35	129,81	130,04	127,68	
The water release from reservoir	cu.m/sec	265	154	186	129	649	1272	6930

THE RESULTS OF THE NON-GROWING PERIOD OF 1997-1998 AND PERFECTIONING OF THE WATER RESERVOIRS' CASCADE OPERATION REGIME AND THE WATER INTAKE LIMITS IN AMUDARYA AND SYRDARYA RIVER BASINS FOR THE GROWING PERIOD OF 1998[2]

The non-growing period of 1997-1998 is over; the water intake limits from SyrDarya river and Naryn-SyrDarya reservoirs' cascade operation regime for this period were approved by the ICWC Meeting members in September, 1997 in Tashkent. Let us characterize briefly the water-related economy situation in SyrDarya river basin for the considered period. At the first, we note that real water supply turned out higher then expected – influx to the SyrDarya trunk lower the Farkhad gauging station increased especially sharply.

The same as during the last year inter-departmental contradictions, first of all, hindered to the available water resources reasonable use. Intergovernmental agreements on the thermal and power resources compensation deliveries, were signed with delay and not always fulfilled, especially by the Republic of Kazakhstan. For this reason during non-growing period Toktogul reservoir was released on 1 cu. km more than it was foreseen by the schedule (Table 1). Beside that keeping near 1 cu. km in Kairakkum reservoir during the growing period of 1997 according to Makhram pumping station working conditions, "Barky Tochik" company has not released the necessary volume in September-November 1997. This fact together with high releases from Toktogul made it necessary to increase water releases from Kairakkum reservoir sharply since January of the current year. The actual water releases from Toktogul and Kairakkum fastly filled the cascade trunk reservoirs, as well as water releases from Chardara were limited by glacial situation in the lower reaches of the river, so since February 25, 1998 the water releases were started into Arnasay sink (totally for the non-growing period it was released 2.159 cu. km), moreover the water releases into Arnasay were continued in April too. It is absolutely clear that the necessary volume was constituted by water releases from Toktogul, and the volume, which was for unexplained reasons kept in Kairakkum reservoir at the beginning of non-growing period. As in the previous years 1 cu. km of water from Kairakkum without any benefit was released in the Arnasay sink. It is known that under actual Toktogul winter regime. Kairakkum reservoir is always filled up in December-January. As a result, Kairakkum winter regime does not coincide with Chardara reservoir operation determined by low passing ability of SyrDarya lower reaches during the period of ice staying.

[2] Information on the first question of the ICWC Meeting Agenda

Table 1

COMPARATIVE REGISTER OF PROJECT AND ACTUAL WATER RELEASES
REGIMES FROM TOKTOGUL AND KAIRAKKUM RESERVOIRS
IN THE NON-GROWING PERIOD OF 1997-1998

RESERVOIR	Unit	Month						TOTAL	Reservoir's volume, mln cu. m		
		October	No-vember	Decem-ber	January	February	March		On Octo-ber 1, 1997	On April 1, 1998	
										schedule	fact
TOKTOGUL									11790	8136	7247
1. Water releases on sche-	cu. m/s	181	395	460	495	490	300				
dule, adopted in Bishkek	mln cu. m	485	1023	1233	1327	1186	804	6058			
2. Actual water releases	cu. m/s	167	451	532	596	541	451				
	mln cu. m	448	1168	1426	1597	1307	1208	7154			
3. Deviations*	cu. m/s	-14	56	72	101	51	151				
	mln cu. m	-38	145	193	271	123	404	1098			
KAIRAKKUM									1710	3418	3212
1. Water releases on sched-	cu. m/s	256	400	500	550	691	446				
ule											
	mln cu. m	686	1036	1340	1474	1672	1195	7403			
2. Actual water releases	cu. m/s	247	490	630	846	891	977				
	mln cu. m	662	1269	1688	2273	2146	2618	10657			
3. Deviations *	cu. m/s	-9	90	130	296	200	531				
	mln cu. m	-24	233	348	793	484	1423	3258			

* Remark.
+ the actual water release is more than foreseen by schedule;
- the actual water release is less than foreseen by schedule.

The changes of Naryn-SyrDarya cascade reservoirs' volumes and the dynamics of water releases from them for the considered period are presented in Tables 2 and 3.

Table 2

Reservoir	Reservoir's volume, mln cu. m			
	On October 1, 1997	On April 1, 1998		On April 1, 1997
		forecast	fact	
Toktogul	11790	8136	7247	9781
Andijan	379	513	632	1372
Charvak	1297	800	566	1008
Kairakkum	1710	3418	3212	2948
Chardara	616	5355	5218	5335

Table 3

Reservoir	Water releases, mln cu. m	
	On schedule	fact
Toktogul	6055	7154
Andijan	512	453
Charvak	1531	1805
Kairakkum	7401	10657
Chardara	3000	5337

From the Table 2 is evident that at the beginning of the growing period the water resources of Naryn-SyrDarya cascade upper reservoirs' turned out 3.7 cu. km less than on the same date of last year, while 2.5 cu. km was a share of Toktogul reservoir.

The water intakes for the non-growing period for ICWC states-members are presented in the Table 4, the water users had not any reclamation.

Table 4

Republic, Water site	ICWC limit, mln. cu. m	Fact, mln. cu. m	%%
The Kyrgyz Republic	20	11,6	58,0
The Republic of Uzbekistan	2350	2702,0	115,0
The Republic of Tadjikistan	200	226,0	113,0
The Republic of Kazakhstan (ICWC)	400	334,0	83,0
Beside that water supply to the Aral Sea coastal zone	2025	2337	

The actual Naryn-SyrDarya cascade operation regime for the non-growing period of the current year is presented in the Table 5.

It is known that high precipitation rate in January and especially February in some regions were significantly higher to compare with the norm which allowed for Central Asian

states hydrometservices to correct their water resources forecasts on the growing period, on average from 75 % of norm (on forecast of January of current year) till 110-130 % (on forecast of April 9, 1998) excluding Karadarya river basin. Basing on above mentioned, BWO "SyrDarya" revised the Naryn-SyrDarya reservoirs cascade operation regime and water intake limits on the growing period of the current year. The schedule-forecast of the Naryn-SyrDarya reservoirs cascade operation regime on the growing period of 1998 is presented in the Table 6.

Therefore the non-fulfillment of the intergovernmental agreements on the hydropower stations of Naryn-SyrDarya reservoirs cascade waterpower resources' use can deteriorate not only the cascade opearation regime realization and water supply of all SyrDarya basin's water users in this growing period, but leads to the loss of cascade's management in the future.

Since April 2, 1998 Joint-Stock company "KEGOK" changed the scheme of the republic's south region and Almaty powersystems energy supply that did not allow to fulfill above mentioned agreements and can change Toktogul hydrostructure water releases regime. It is necessary for ICWC members to control constantly strict following of agreements ant take all necessary measures up to appeal to the governments to stabilize situation timely.

The April 1998 is over. It was characterized by higher water supply for Chirchik and Karadarya, as well as for SyrDarya as a whole. In relation with that Naryn-SyrDarya reservoirs cascade's filling was ahead of the schedule on 1.15 cu. km. Especially big inflow was noticed in the middle reaches of the river, therefore the water release to Arnasay continued hollow (cavity) and for the first five April days it was released 179 mln. cu. m. Total water intakes were kept at the last year level and monthly water supply to the Aral Sea was equal 700 mln. cu. m. In a whole on May 1, 1998 the water-related situation is favorable.

Table 5

SCHEDULE
of Naryn-SyrDarya reservoirs cascade operation
on period since October 1, 1997 till March 31, 1998

	Unit	October	Novem-ber	Decem-ber	January	February	March	The total, mln.cu.m
		fact	fact	fact	fact	fact	fact	
TOKTOGUL RESERVOIR								
Reservoir inflow	cu.m/s	206	183	175	161	157	159	
	mln.cu.m	552	474	469	431	380	426	2732
Volume: the beginning of period	mln.cu.m	11790	11853	11174	10215	9001	8030	
the end of period	mln.cu.m	11853	11174	10215	9001	8030	7247	-
Reservoir water release	cu.m/s	167	451	532	596	541	451	
	mln.cu.m	447	1169	1425	1596	1309	1208	7154
KAIRAKKUM RESERVOIR								
Reservoir inflow	cu.m/s	252	614	815	826	858	714	
	mln.cu.m	675	1591	2183	2212	2076	1912	10650
Volume: the beginning of period	mln.cu.m	1710	1684	2026	2731	3065	3374	
the end of period	mln.cu.m	1684	2026	2731	3065	3374	3212	-
Reservoir water release	cu.m/s	247	490	630	846	891	977	
	mln.cu.m	662	1270	1687	2266	2156	2617	10657
CHARDARA RESERVOIR								
Reservoir inflow	cu.m/s	178	454	682	865	1054	1309	
	mln.cu.m	477	1177	1827	2317	2550	3506	11853
Volume: the beginning of period	mln.cu.m	616	663	1263	2189	3610	5016	
the end of period	mln.cu.m	663	1263	2189	3610	5016	5218	-
Reservoir water release	cu.m/s	145	262	360	360	370	540	
	mln.cu.m	388	679	964	964	895	1446	5337
CHARVAK RESERVOIR								
Reservoir inflow	cu.m/s	87	73	62	58	61	81	
	mln.cu.m	233	189	166	155	148	217	1108
Volume: the beginning of period	mln.cu.m	1297	1080	995	971	873	826	
the end of period	mln.cu.m	1080	995	971	873	826	566	-
Reservoir water release	cu.m/s	167	101	79	78	82	178	
	mln.cu.m	447	262	212	209	198	477	1805
ANDIJAN RESERVOIR								
Reservoir inflow	cu.m/s	37	36	51	54	46	50	
	mln.cu.m	99	93	137	145	111	134	719
Volume: the beginning of period	mln.cu.m	379	220	227	345	463	550	
the end of period	mln.cu.m	220	227	345	463	550	632	-
Reservoir water release	cu.m/s	93	32	9	9	8	20	
	mln.cu.m	249	83	24	24	19	54	453
Release to Kyzylkum canal	cu.m/s	5	2	0	2	5	3	
	mln.cu.m	13	5	0	5	12	8	44
Release to Arnasay sink	cu.m/s	0	0	0	0	60	752	
	mln.cu.m	0	0	0	0	145	2014	2159
Release to Aral Sea	cu.m/s	110	95	70	150	200	270	
fact	mln.cu.m	295	246	187	402	484	723	2337

Table 6

SCHEDULE-FORECAST
of Naryn-SyrDarya reservoirs cascade operation
on period since April 1, 1998 till September 31, 1998
according to Gidromet forecast

	Unit	April (fact)	May	June	July	August	September	The total, mln.cu.m
TOKTOGUL RESERVOIR								
Reservoir inflow	cu.m/s	272	610	1004	880	606	335	
	mln.cu.m	705	1634	2602	2357	1623	868	9790
Volume: the beginning of period	mln.cu.m	7247	7451	8358	9661	10266	10266	
the end of period	mln.cu.m	7371	8358	9661	10266	10266	10624	
End of period (fact)	mln.cu.m	7451	-	-	-	-	-	-
Reservoir water release	cu.m/s	223	270	500	650	600	190	
	mln.cu.m	578	723	1296	1741	1607	492	6438
KAIRAKKUM RESERVOIR								
Reservoir inflow	cu.m/s	465	481	461	512	552	298	
	mln.cu.m	1205	1288	1195	1371	1478	772	7311
Volume: the beginning of period	mln.cu.m	3211	3463	3418	2853	2025	1771	
the end of period	mln.cu.m	3372	3418	2853	2025	1771	1716	
End of period (fact)	mln.cu.m	3463	-	-	-	-	-	-
Reservoir water release	cu.m/s	442	452	600	700	570	284	
	mln.cu.m	1146	1210	1555	1875	1527	737	8049
CHARDARA RESERVOIR								
Reservoir inflow	cu.m/s	800	461	338	204	195	258	
	mln.cu.m	2074	1234	877	546	522	669	5922
Volume: the beginning of period	mln.cu.m	5218	5283	4602	3488	2018	1297	
the end of period	mln.cu.m	5399	4602	3488	2018	1297	1347	
End of period (fact)	mln.cu.m	5283	-	-	-	-	-	-
Reservoir water release	cu.m/s	610	600	626	588	379	222	
	mln.cu.m	1581	1607	1623	1575	1015	575	7976
CHARVAK RESERVOIR								
Reservoir inflow	cu.m/s	342	500	676	509	286	165	
	mln.cu.m	886	1339	1752	1363	766	428	6535
Volume: the beginning of period	mln.cu.m	566	1055	1589	2000	1886	1509	
the end of period	mln.cu.m	921	1589	2000	1886	1509	1433	
End of period (fact)	mln.cu.m	1055	-	-	-	-	-	-
Reservoir water release	cu.m/s	205	300	516	550	425	193	
	mln.cu.m	531	804	1338	1473	1138	500	5785
ANDIJAN RESERVOIR								
Reservoir inflow	cu.m/s	164	240	246	159	78	51	
	mln.cu.m	425	643	638	426	209	132	2473
Volume: the beginning of period	mln.cu.m	632	996	1316	1564	1452	1211	
the end of period	mln.cu.m	945	1316	1564	1452	1211	1211	
End of period (fact)	mln.cu.m	996	-	-	-	-	-	-
Reservoir water release	cu.m/s	43	120	150	200	167	50	
	mln.cu.m	111	321	389	536	447	130	1934
Release to Kyzylkum canal	cu.m/s	15	110	119	135	90	20	
	mln.cu.m	39	295	308	362	241	52	1296
Release to Arnasay sink	cu.m/s	69	0	0	0	0	0	
	mln.cu.m	179	0	0	0	0	0	179
Release to Aral Sea	cu.m/s	270	63	63	63	63	64	
	mln.cu.m	700	169	163	169	169	166	1535

STATE OF THE WORKS ON THE ARAL SEA BASIN'S WATER RESOURCES USE AND PROTECTION INFORMATION SYSTEM'S DEVELOPMENT ON APRIL 1998[3]

:

1. Under the European Union technical assistance 8 centers were equipped with the necessary equipment and software. The regional center under SIC ICWC, 2 regional centers under BWO's and 5 national ones under every Ministry of Agriculture and Water Management;

2. The first line of Aral Sea basin Program (ASBP) was developed by the structure and format (tables in Access and GIS maping).

3. Retrospective (1986-1995) data input into Access tables was executed.

4. In Geographical Information System 21 covers were created; these covers already now allow to get the next maps in any convenient scale (1:100,000; 1:500,000; etc.):

• administrative up to the level of district (region, state, province);

• gauging stations, water intakes and other point objects, big irrigation and drainage networks on the base of administrative division;

• irrigated areas at 1995 on base of space survey (region, state, province), etc.

5. GIS and Access coordination is being fulfilled.

6. An immediate program modules were developed, which work with the data base. The volume and information quality analysis of Data Base shows:

• all information in DB demands careful check, mutual coordination and correction;

• created output formats are acceptable on their structure, *but they are not ready for users until data test completion*;

• to solve above mentioned tasks the DB demands additional information on water and land resources, correction of data in economy, information expantion on water quality, the "social-economic indicators" and "environment" subbases creation;

• for users it's necessary to form their own demands to the data, forms and periods of its submission;

• the exchange between the bases is fulfilled till present time on diskettes and does not satisfy modern requirements.

The main provisions of information exchange

It is necessary to fill up DB constantly. So it's possible just under the reliable information regular exchange between partners.

The main thesises of such exchange are the following: Aral Sea Basin Program Data Base is created as a system of regional level with eight equal partners (see scheme), having exact copy of the regional DB and software to it.

The partners are responsible for providing in-time regional and national DB with the reliable information and giving it free of charge.

Two lists of information for users are agreed: open and closed.

Any information is given to the partners free of charge, but it costs for any other users (on the first list it's free, on the second under on the department's regulations, which gives this information).

All system's partners are informed about information distribution from DB to users (it's content, volume, form and payment terms).

[3] Information on the second question of the ICWC Meeting Agenda

Difficulties in ASBP information system creation

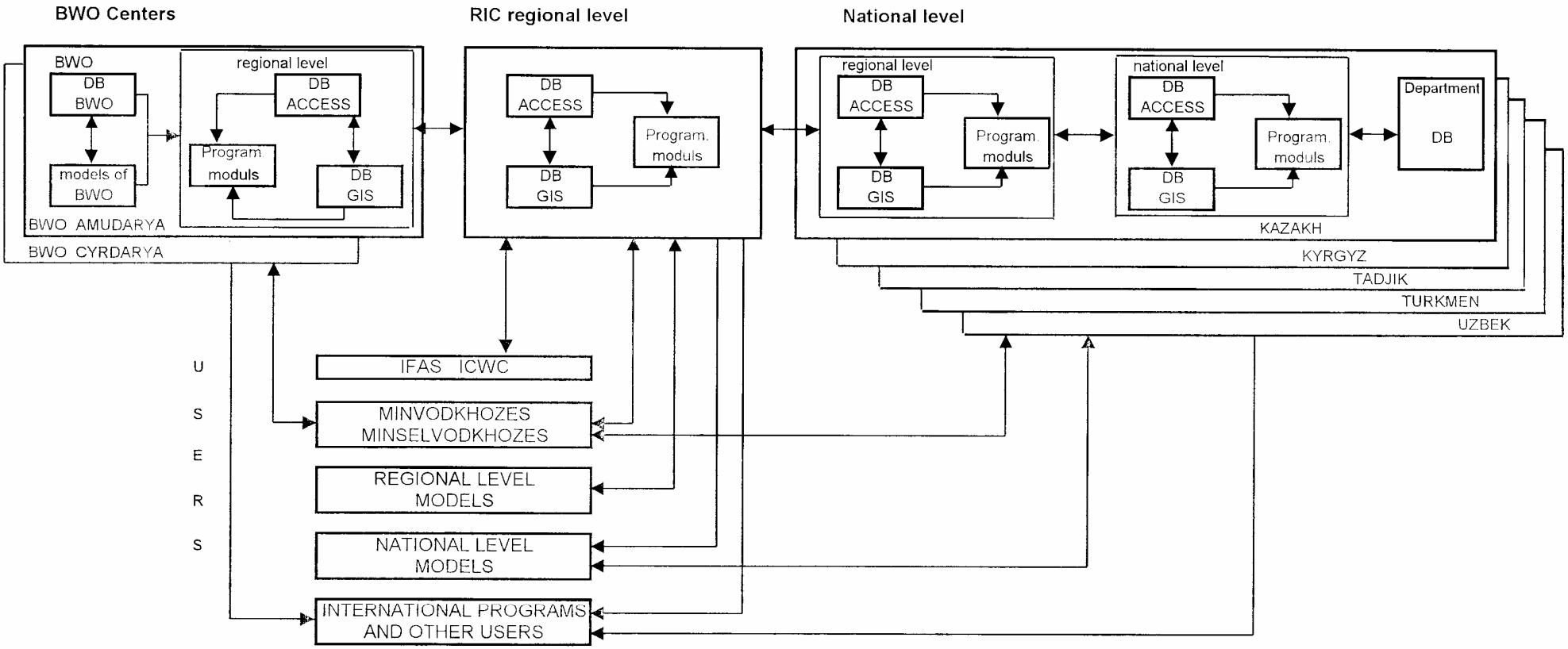
The limitation of ICWC financing of system's development and it's filling with data.

Since 1996 only Uzbekistan realizes limited, but regular development's financing.

The national centers' stuffs are very limited and not completed. Only Uzbek and Kyrgyz national centers' situation may be considered as satisfactory. The departmental disconnection even within single state, the absence of even temporary agreements of the information exchange and data delivery in ASBP is resulted in passing of contradictory information in BD (for example, on water intakes between BWO's and Minvodkhozes), disparities of the resources and water use, irrigated areas, etc. Interbase exchange problems have not been solved absolutely, mainly because of absence of access to Internet of all centers (except the Regional) and bad telephone connection for fax-modem communication establishing. This fact makes the data check and it's fast passing to regional group difficult.

Therefore "Agreement on information exchange", was prepared and initiated.

ICWC has approved SIC ICWC work project, which includes all national bases development financing, but in fact except Uzbekistan, it's not guaranteed. The financing by sponsors under WARMIS Sub-Project is limited too.



INFOMATION CENTERS AND USERS OF ASBP INFOMSTION SYSTEM.

THE MAIN GOALS AND ASPECTS OF ARAL SEA BASIN'S WATER RESOURCES RATIONAL USE STRATEGY[4]

1. General

Present social-economic and environmental situation in the Central Asian region demands a new strategy of available water resources' rational use. Water saving in all fields of water use is a single direction, providing stable economic development of the new independent states and ecological situation's stabilization in the region. It is necessary to refuse from the last practice of unlimited water expense and ignoring nature's interests. In all regions people must understand and realize available abilities of water saving under its productivity retaining. There are enormous reserves of water saving by means of technical and institutional measures, which don't demand big investments.

2. *The proof of water saving possibility*

Our ancestors' experience in the Central Asian region, foreign leading countries' (Israel, Jordan) experience, some pilot projects and experimental plots modern experience in the region, the WUFMAS Program – all this proves possibility of low-cost water saving. The good proof of enormous reserves in water saving, on one hand, and impossibility to solve all problems of agricultural production with the help of water, on the other hand – is comparison of two results of water use in SyrDarya basin in 1997. Maktaaral zone's farms, taking water from Dustlik canal in Kazakhstan during a year got 4800 cu. m per ha of water against 13200 cu. m per ha in Uzbek part of canal in SyrDarya province. However Kazakh farmers have got the yield of cotton and grain from every hectare two times more under the obvious lack of water. Qualitative leveling and choice of field rational dimensions, strict following technological regulations of agricultural crops development under water lack conditions, increasing of return water use – all these are just some examples of water saving technical measures.

A special question is the reduction of losses and mistakes in water allocation, water resources management, extra water losses in channels, unproductive discharges beyond the river and Aral, expenditures on the environment, especially in lower reaches as well as losses as a result of wrong information. An elimination of such losses' reasons does not demand big expenses.

Water productivity accounting contains big reserves. For example, intensification of reservoir's use for the fish production and for another purposes. The comparison of the water productivity indicators by means of publicity and society awareness must impel water users of different parts of the region, who are busy in the same economic fields, to compete among themselves. It is necessary to awake the public consciousness and society responsibility for the careful water treatment.

The rational water use will reduce the load on irrigation and collector-drainage networks. This must contribute to exploitation expenses' reduction, because almost 50 % of all irrigated lands are irrigated with the help of pumping stations or from the wells, where the power expenses are high.

[4] Information on the additional question of the ICWC Meeting Agenda

3. *Problem of salt is a consequence of the efficient water use*

During the irrigation inefficient water use increases the losses, that causes increasing of groundwater level. This promotes the salt mobilization in productive soils' layer and as a result – lands productivity losses. The groundwater oversaturation increases the load on collector-drainage network and demands constant expenses for regular exploitation measures on drainage maintenance as well as big finances for its development.

Collector-drainage flow increases mostly with high water mineralization, is accompanied by its discharge into the rivers, essentially deteriorating the river water quality.

The salt management directly depends on efficient water use during lands irrigation.

4. *IFAS Administration's decision of March 17, 1998*

IFAS Administration on March 17, 1998 considered and proved "The main objectives and aspects of Aral Sea basin's water resources rational use strategy", prepared by EC IFAS. In "The main objectives and aspects…" essential shortages in the work of national and regional water-related organizations and all water users rational water resources use are noted. The water-related bodies do not take into account the water savings possibilities and insist on unreasonable increased limits.

IFAS Administration obligated ICWC to concentrate its attention on water resources rational use. It is supposed to revise directions of activity of all ICWC bodies fulfilling IFAS tasks.

5. *ICWC policy on rational water resources use*

For ICWC it is necessary to take the following measures:

5.1. The strategic actions program must be directed to the systematic and very detailed analysis on every country, province, system, planning zone:

• potential land and water productivity, based on available information especially for dry years;

• specific biological consumption for agricultural crops production (using CROPWAT-FAO methodology);

• analysis of production losses caused by reclamation and water factors and possibility of their elimination with estimation of undertaken measures priority;

• the salt and water balances estimation within the fields (planning zones), recommendations on their bringing up to the ecologically sustainable parameters (minimization of salt exchange between the river and irrigated area, between aeration zone and groundwater with gradual reduction of salt stores in aeration zone); besides that the estimation of possibility of return waters maximum involvement to use them again near places of their forming;

• estimation of possibility of unproductive releases reduction, increasing local waters use, including underground ones;

• estimation of organizational water losses reduction in all components of irrigation system and also unproductive water losses on a farm and in the field and singling out possible low-cost measures on their elimination;

• recommendations for high infiltration zone on the sloping lands, adyrs and high valleys; these recommendations will reduce the water losses and negative effect on lower placed areas and also expenses on machinery water supply;

• estimation of water saving consequences for return waters release reduction to the rivers and reservoirs and water quality improvement.

5.2. It is necessary to prepare an exact information for the different layers of society,

which would convince decision makers, who plan investments and water-related works, and water users to choose an optimal water consumption with mutual benefit both for water consumer and for society.

5.3. Introduction of water pricing, international water laws (equitable and reasonable use, polluter pays, etc.) enforces to take economic measures under which any overuse and transboundary pollutions, which are the consequence of water overconsumption must be compensated by its appearence's guilties. On other hand, it is profitable for water users himself to use the water carefully, instead of paying for expensive water delivery.

5.4. The important component of water saving program should become informing society, the public opinion forming and involving the society directly and water users in water saving. In this program it's very important to take into account possible resistance of decision-makers and politicians, national leaders, water users with their living and economic difficulties, water-related workers, who hardly finds finances to support their structures, etc. This campaign should be thought over very well, planned and organized in all region's countries. Social interrogatories on questions of water saving and water management is a good method of campaign's development. Since the childhood the thought of the water value should be grafted to a man.

5.5. The following measures should be undertaken in water saving:

• on water use level – increasing of payment for water use over technically achievable and biological level of consumption (on the level of the payment for resource's forming);

• on interstate level – over ecologically allowed level of water consumption in the basin, defined by the share of previous user in historically happened conditions as a state fees to IFAS;

• water users' encouragement for water saving lower the strict water use's standards as a bonus payments in dimensions of state expenses for the cubic meter of water forming, release of taxes or additional financial incentives;

• permission of own limits sale to other water users;

• the work's bonus system for water-related bodies for water saving.

5.6. Compulsory introduction of the water accounting of all water users and water consumers for their account. Penalty sanctions for watermeters absence, which make water user to stimulate the water calculation in every point.

5.7. Organizational measures on careful water consumption:

gradual restriction of water limits at country and provincial level; creation of public entities on water use at all water use levels from the basin (public water-related committees as entities for support and control activity) to the systems and raivodkhoz management; creation of water users' association (WUA) on the level of aggregated (in cities – communal) forms. The WUA specific task is to participate in the organization of strict water cycle and water use limitation; the gradual transition to the orientation under the planning of water use for water consumption per product unit.

PROCEEDING
of the Meeting on WARMIS Information System development

June 23, 1998 Tashkent

The participants' list is enclosed.

Agenda:

1. An introduction by GEF Project Agency Director V.Dukhovny.
2. The discussion of common program of works on WARMIS for 2 years.
3. The discussion and coordination TOR for the national working groups and BWO.
4. Presentation of module "The water balance of the river and/or the reservoir" with use of GIS know-how and its transmission to the National Working Group (NWG).
5. The transmission of NWG module "The water balance of planning zone".

Exchanging by their opinions, the participants state:

1. WARMIS should be an instrument for:

annual and perspective planning;

estimation of available water and land resources use;

information delivery to models of water resources management and other necessary models and also to consumers in convenient for them form.

It is important, at first to concentrate an attention on the following:

all data checking and its' reliability and accuracy providing;

data aggregation as an information convenient for users at the regional and national level;

GIS and data base co-ordination, especially on planning zones;

Data base completion till the possibility of it's handing over to exploitation with appropriate software and manual for users;

Organizing of automatic control over the data in the WARMIS base.

2. National coordinators support common program of works on WARMIS for 2 years.

3. National coordinators coordinate TOR for data quality checking in DB WARMIS on period of 1986-1995 and take obligation to bring all amendments according to the Regional Working Group's (RWG) remarks into the information on own republic for all paid before sub-bases independently from works on this TOR.

4. National coordinators in principle agree with TOR for data preparation on water resources of 1995-1996-1997 and their analysis, expanding of sub-bases "Water Quality", "Economy", "Water Resources". They think it is necessary to hold working meeting on acquaintance and discussion of above mentioned sub-bases. The signing this TORs by executors will be done at this working meeting.

5. National coordinators will try to fulfill TOR and all their obligations and debts for WARMAP and RWG project timely.

6. To present two separate TOR for BWO "AmuDarya" and BWO "SyrDarya" according to their offers; to discuss completed TOR with BWO and WARMAP representatives till June 30, 1998.

7. Seminar's participants came to common opinion of the necessity to start works on mathematical modeling. To charge A.Sorokin to prepare TOR on modeling. The TOR draft

should be presented to WARMAP till July 1, 1998.

8. National coordinators note:

problem with BWO "AmuDarya", Kyrgyz and Tadjik national groups equipment is unsolved until present time; an additional equipment for RWG is extremely necessary; the conference participants ask WARMAP project to support WARMIS centers with technical assistance;

to set E-mail in every group and outlet in Internet and the group requests WARMAP assistance in this problem's solution during the first year of WARMIS project implementation;

under the successful development of the WARMIS first part, all groups' promises in quality and timely work fulfillment and offers preparation on the WARMIS development at expense of financing for 1999-2000, WARMAP project promises to arrange with EC the problem of sub-project financing increase.

Signatures:

For WARMAP Project	Peter van den Hoven
	Albert van Dayk
	Robert den Haan
	V.Sokolov
GEF Project Agency Director	V.Dukhovny
For BWO "AmuDarya"	O.Lysenko
For BWO "SyrDarya"	M.Khamidov
For SIC ICWC	I.Sorokina
	A.Platonov
	F.Garayev
	A.Sorokin
For Kazakh NWG	N.Kipshakbayev
For Kyrgyz NWG	L.Kiyashkina
For Tadjik NWG	N.Nasyrov
For Turkmen NWG	V.Krokhmal
For Uzbek NWG	B.Yusupov

Proceeding of seminar-meeting of national Hydromet services (NHMS) heads and Central Asian states water organizations deputies heads on the GEF Project "Transboundary water resources monitoring" component implementation

May 20, 1998 Tashkent

1. To admit that "Transboundary water resources monitoring" Project is an important contribution to development and strengthening of monitoring system, allowing organization of water resources management on transboundary rivers. To deem the Project implementation is a prior aspect of Central Asian states NHMS activity.

2. To agree with charging NHMS to realize this project in each country, to prepare the reconstruction and construction places, to set equipment and to provide exploitation and maintain control stations. To create within NHMS working groups on the Project implementation with the participation of water-related organizations' representatives.

3. To take into account that the Committee on Water Resources of the Ministry of Agriculture of the Republic of Kazakhstan, the Department of Water Management of the Ministry of Agriculture and Water Management of Kyrgyz Republic, the Ministry of Water Management of the Republic of Tadjikistan, the Ministry of Water Management of the Turkmenistan, the Ministry of Agriculture and Water Management of the Republic of Uzbekistan take responsibility to finance and fulfill construction of the stations on surface transboundary waters accounting included in coordinated list of the GEF Project "Transboundary waters monitoring". The sides should give out through their governments allocate the necessary finance for construction beginning since 1999 if possible of expense of subscriptions to IFAS.

4. NHMS together with water-related organizations of the states, BWO "AmuDarya", BWO "SyrDarya" will work out joint measurers on the use of created networks and proposed methods to submit timely operative data to BWO and water-related bodies.

5. The seminar-conference's participants charge SANIGMI (The Republic of Uzbekistan) to realize the function of methodological co-ordination and training carrying out on reconstructed and newly constructed stations exploitation.

6. Delegations of Turkmenistan, the Republic of Uzbekistan and the Kyrgyz Republic proposed to bring some changes into marked gauging stations' structure:

- over Turkmenistan – instead of gauging stations on Southern and Parsankul collectors is proposed to set the gauging station on the head of Karakum canal and Darganata gauging station on AmuDarya river. During 10 days period Turkmen delegation will coordinate this replacement with Turkmenistan Government and inform EC IFAS;
- over the Republic of Uzbekistan the Karadarya gauging station (vil. Karabagish) is excluded and instead of it SyrDarya-Kzylkishlak gauging station in the Republic of Tadjikistan will be included;
- over the Kyrgyz Republic there is a request to find the possibility to include additionally gauging station Naryn-Uchterek.

The Republic of Kazakhstan	
Kazgidromet	V.Boshkatov
Komvodresource	A.Amirkhanov
The Kyrgyz Republic	
Kyrgyzgidromet	M.Bakanov
Depvodkhoz of Minselvodkhoz	
The Republic of Tadjikistan	
Glavtadjikgidromet	B.Makhmadaliyev
Minvodkhoz	N.Ashurov
Turkmenistan	
Turkmengidromet	O.Annayev
Minvodkhoz	G.Golubchenko
The Republic of Uzbekistan	
Glavgidromet	V.Chub
Minselvodkhoz	A.Jalalov
BWO "AmuDarya"	I.Kalandarov
BWO "SyrDarya"	M.Khamidov

INTERNATIONAL CONFERENCE "WATER - AN APPROACHING CRISIS: HOW TO SURVIVE IN XXI CENTURY?"

In period since June 3 till June 6 an International Conference, organized by UNESCO, WMO, MGP on topic "Water – an approaching crisis: how to survive in XXI century?" had place in Paris, in which SIC ICWC Director Prof. V.Dukhovny took part on behalf of ICWC and EC IFAS.

By the beginning of the XXI century the water became extra deficit. Irrigation consumes 70 % of water diversion in the world scale and approximately 90 % in developed countries of arid region.

For the last 30 years food provision per capita increased on 20 % and in developed countries on 30 %. In 1970 50 % of population starved all over the world, but at present time this category of people is reduced up to 10 %. This has happened due to irrigation in combination with modern know-how in farming based on high-yield verities, fertilizers, pesticides, etc.

Inspire of such water consumption's increase, almost the quarter of the world population has not necessary water supply and a half of one – satisfactory water disposal and sanitary.

Adopted on the Conference basic norm of water consumption (50 liters per day per capita) should be the obligations' base for every state as minimum, which should be guaranteed by the society to its each member. Beside that it means the right on 50 liters of good quality water, as all over the world quality is changing much faster than quantity.

So the Conference concentrated its attention on several principal aspects:

1. Information. Specialists on water resources should constantly look for more effective ways in reaching of information accessibility and usefulness and also in development of knowledge about advantages of water resources information among water users.

All appropriate components of hydrological system should be considered and it is necessary to take into account all interconnections between components, mainly surface and ground waters. It is necessary to take as a rule integrated approach to the data base and information management.

Scales of measurements in space and time related to water should correspond to the scales of phenomena considered, as well as to the expected information use. Information in the world scale and the country scale meets the requirements of national and international policy development, but the solutions related to water resources management are usually taken at lower levels and also within river basins and aquifers. Subsequent estimation of water resources should reflect these thesis's.

It's very important to pay attention to the water requirements' character and its use. In total all "stores and inflows" – natural and artificial – to the hydrological system should be calculated in order those who manages resources would define the manipulation effect in one part of the system on its other parts. The control over the water-related information should be considered within the system – usually this is river basin/aquifers system.

The water resources information's management should be realized in the mutual relation with the physical and biological aspects of environment (for example, necessary conditions for migratory birds), human society (for example, the importance of water streams in terms of entertainment and recreation) and economy (for example, food industry, water use for industrial purposes). This information should be used in development of strategy and action plans for comprehensive environment management.

The efforts should be directed to understanding of physical and biological processes, controlling hydrological systems' functioning. It is important to raise the level of data collection from the point of view of records' duration and some changes. That will provide possibility of models' development, which can be used for extrapolation on plots, inaccessible for monitoring. The following fields should be studied: mountainous and glacial zones, extra arid zones, wetlands, as well as small objects such as streams and ponds, which together have a very big importance for hydrological and ecological processes.

It is necessary to establish official procedures related to quality's guarantee for the data, got in result of monitoring and also model's realization, including adoption of appropriate standards and documentation on the procedures. Estimation of changeability should be done for monitoring data, water balances and the results of modeling.

Information should be accessible not only in usual conditions, but in the conditions of water resources' changeability in space and time. The main stress should be done on actual and potential disasters and crisis, for example, extreme situations during flood and drought.

Modern potential methods, remote sensing and know-how of information management should be used together with the following thesis's:

• to produce cheep, daily monitoring and measurements (for example, control of humidity expansion within the soil by satellite survey emages);

• to work out computer methods (models, GIS), able to describe, explain and forecast the character of hydrological systems' change with degree of accuracy and reliability which is necessary for decision-makers. Under the standardized data use models' comparison should be preferred;

• to supply the modern data and water resources' information banks and access to them;

• to submit information related to water easily accessible for non-specialists.

2. Water quality. Water quality is constantly getting worse and causes infections. Only in USA they spend every year $US 20 billions to fight these infections. Hence:

• the water quality should be considered the same important aspect of water management as its quantity;

• recommended minimum of monitoring gauging stations over water quality should be not less than 1 station per 100 thousands people, in the future – 1 station per 10 thousands people;

• the lack of knowledge and understanding of the relations between potable water's microbiology and hydrological processes and water quality should be overcome;

• it should be made clear that the self-purifying water ability is extremely limited because of anthropogenous changes of water flows and their proximity to exhaustion;

• public health and water quality problems should be solved together on multi-sectoral and multi-structural base;

• public opinion and public participation are the most important components of policy and actions on approvement of water quality and environment protection.

3. The reduction of negative effect of human activity on water resources should be based on the constant analysis of water resources and taking clear measures, resisting to increasing anthropogenous negative phenomena causing the crisis situation. This concerns at the first turn:

• organizational measures, including three types of stress prevention: increasing of the participation share of water users; creation with their help the river basin organizations; development of public influence on all water users and related with them subjects;

• regulatory measures, including water right;

• political measures, including an efficient line of the governments on water use strengthening, multi-criterial approach; realization of an absolute responsibility for the future.

4. Fight against water lack based on complex approach which coordinates the future basin human water requirements under joint use of all types of water (surface, underground, return) taking into account the nature demands, recreation, etc. Besides that such integration should have place in global, continental, regional, national and basin aspects, the clear realizing of water productivity increasing possibilities shows the society tendency to economic water use.

5. People do not understand the interrelations between ecological, social and economic value of water. Therefore, an economic cost of water can not replace the rest values. Prior premises of sustainable financial water resources management are the following:

• realizing and estimation of ratio of these three values;

• realizing of interrelation between the water shortage and its value;

• water cost should be considered as obligatory element of water management, as the mean of impelling for water saving and water distribution criteria, but not as the method of water-related branch maintenance;

• water services' payment at the local level should differ very much from financial interrelations at the basin and regional level, however every country should work out its own responsible approach to the financing of water sector at the state level and water user's level;

• in common the water market is not created and would not be created; some small sectors of water market are functioning, but in principle possibilities of market mechanism in water management should be studied and based on.

Conclusions

1. The water lack differs in the different zones depending on such factors as climatic changes, interrelation with the global economies, the global financial market and so on. The water lack, at first, depends on distribution, i.e. water possibilities of given geographic place and anthropogenous load on it. But the water lack becomes really global problem due to interrelation of water potential with the different aspects of development: economic growth, the population growth, and political and social conditions.

The following tendencies have arisen:

Considering water as a vital resource, international water right should clearly and firmly provide every man’s right on water in equal degree and right on the retaining of the water objects in their natural state. This right should be guaranteed as the minimal guaranteed water consumption for man’s needs, social needs and it should become the modern water use criteria. From this point of view FAO counts necessary consumption of 2400 km^3 of water for irrigation of lands to compare with 7000 km^3 consumed.

Another direction – this is increase of land productivity. According to the research of Alexandre Takis (1995) the scales of planned development till 2010 require an increasing of the lands’ irrigation only on 10 %, by the chance to raise the land productivity 2.2 times in different countries. Hence the following questions are arisen:

a) Orientation on the food and water consumption reduction everywhere;

• strengthening of preticipition and rainfed farming;

• aquaculture;

• fish culture.

b) Reduction of water consumption and management by the water requirements;

c) New water consumers participation (developing industry and cities) in water saving in irrigation process at expense of water saving by means of the fundamental methods (lining, conversion to new irrigation technique, etc.).

2. Development of open public information exchange has the significant importance

for some key aspects:

• in the interests of the consensus creation on necessity of prevention of certain negative tendencies in the environment;

• in the interests of the creation and support of the opinion about the possibility to achieve certain water saving among all water users on the base of information about the best examples of water use;

• in the interests of possible disaster phenomena prevention, especially during the flood and drought.

3. The present science state allows to support new approaches for prevention of increasing crisis:

• application of multilevel hierarchic system for complex water use and management decisions;

• use of decision support methods and computer technology on the base of joint man-machinery process.

STRATEGY OF IRRIGATION AND DRAINAGE DEVELOPMENT IN THE FORMER SOCIALIST WORLD CONTRIES (FSC)[5]

Introduction

1. Irrigation and drainage development during FSC period was characterized by the centralized planning, strict annual plans of the lands' development, strong economic and ecological expertise in the planning process, relatively bad quality of construction, state and/or collective farming, subsidizing of electric power costs for water lift and free of charge water supply.

2. At present time physical, financial, economic and ecological stability of irrigation in the majority of the republics is under serious risk.

Main problems are the following:

• Serious deterioration of irrigation and drainage infrastructure caused by insufficient financing of services and repair, absence or very low payment for water. In such situation the irrigation and drainage systems' state will quickly go down, which substantially influences on agricultural production.

• Relatively low quality of water resources management is weakened by further infrastructure deterioration, makes already existing problems of land water logging and salinity more actual and makes reclamation of saline and water logged lands economically unprofitable.

• The majority of available high water lift systems would become economically unreasonable, if users would forced to pay real water and electric power cost. Their closure would cause some social problems.

• Privatization of the former state and collective farms in common is not yet completed. Mainly the credit mechanism is absent or is inadequate for providing farms with the working capital and long-term credit for on-farm irrigation and drainage systems' investments. There is the lack of experience in the modern level management in privatized farms.

• Because of absence of budget financing the majority of irrigation organizations loose their staff and correspondingly working ability.

The Bank investments' expedience

3. Reconstruction and modernization of infrastructure of inter-farm and on-farm irrigation and drainage systems will become the key component in agricultural production rehabilitation in the majority of the region's countries. The sufficient investments are necessary to support existing systems' functioning on, at the least necessary level of efficiency. However, beside Asian Development Bank only the World Bank is the last hope for financing infrastructure's reconstruction.

Strategy

4. ***Agreement of National Strategy on irrigation and drainage with Governments.*** Before starting to prepare the separate project the Bank should agree the irrigation and drainage strategy and correspondent policy and institutional reforms with the Government's representatives (Cabinet of Ministers). This process should be joint, consulting and clear. Water policy seminar's organizing would promote the dialogue with Government and shareholders

[5] World Bank Project 2/23.02.98.

participation. Agreed strategy should be reflected in the following documents: either in National strategy on water sector, or in National strategy in irrigation and drainage or at least in the Note on irrigation and drainage sector. The document should present proposed long-term irrigation and drainage purposes and include:

a) Estimation of common economic perspectives for irrigated farming;

b) Determination of questions of inter-sectional water distribution and perspective estimation of water balance;

c) Estimation of ecological sustainability of existing irrigation with an accent on the salinization and water logging;

d) Estimation of existing infrastructure and determination of priorities in inter-farm and on-farm systems reconstruction;

e) Options of decentralization and strengthening of irrigation organizations, including the water users associations establishing on on-farm systems' management and service and management's transfer or participation in irrigation management for whole or a part of inter-farm system;

f) Financial sustainability, cost return and the farmers' ability to pay;

g) Strategy of social problem solution, related to destruction or instability of the system.

5. ***Structure of incentives.*** Credit should be given only under the minimum progress in the structure of incentives (price and tariff policy and market liberalization) and under changes of private property's rights (farms privatization and land registration). The Bank won't consider the credit for irrigation and drainage systems reconstruction within the borders of the former state or collective farm until such farms will be privatized and stakeholders/owners in joint-stock companies/cooperatives will have appropriate rights. As exception credit may be considered for immediate reconstruction of on-farm systems projects (including, for example, increase of safety of existing dams or other hydrostructures, being in critical state).

6. ***Reconstruction in comparison with new lands' irrigation.*** Credit program for region, considering repeated use of available structures, should make accent on all cases of available infrastructure's reconstruction. Options of irrigated areas extension or new lands reclamation should be declined.

7. ***Planning criteria.*** Economic planning criteria and ecological interests should be united into process of long-term planning for development of irrigation strategies and priority investments.

8. ***Projects in the context of river basin development.*** Large-scale projects of command areas should be considered in the context of river basin's development. It's necessary to prepare in advance the water allocation plan for guarantee of the main conception of the project and design parameters determination. The project could also contain the coordinated purposes on the water management and salinization control within river basin's regional strategy (for example, Aral Sea basin).

9. ***Public participation.*** Stakeholders' participation is necessary at all phases of irrigation national strategies' preparation, the project's option, it's design and introduction.

10. ***Legal structure.*** The strong legal structure development is obligatory to support the policy and coordinated with Governments institutional reforms (water right, participation in irrigation management, water users associations' establishing, etc.).

11. ***Reconstruction and modernization.*** Selection of optimal action program requires preparation of economic management plan. This plan should take into consideration expected standards of irrigation services during the different phases of the reconstruction. These standards should pay attention to expected yield and practice and should be coordinated with the beneficiaries by means of consultations. New standards can require also some system's per-

fectioning. It's very important to provide an adequate control over runoff and measurements of systems and that should be, as possible, synchronized with the water resources cost increase.

12. Reconstruction will be fulfilled during several stages having different purposes:

• Early stages may include only immediate reconstruction of inter-farm systems with the priority of badly functioning structures if it's economically profitable; so the reconstruction may be combined with modernization.

• The next stages are directed towards the further processes of the reconstruction and modernization. Initial standards of operation, management and services should be checked or revised to satisfy better the requirements of considered social infrastructure (privatized farms or water users associations), an expected yield and effectiveness of economic criteria; solutions on the given question define – rehabilitate, reconstruct or replace water structures. It's very important to compare carefully expenses on structural improvements with the expected results.

• Final phases may include further perfectioning of the infrastructure.

13. ***Water users associations at the farm level.*** The question of the state refusal from the right of irrigation systems service and management within the former state or cooperative farms. This in a whole requires water users associations establishing except of those cases when farms continue to be managed as a single unit (for example, joint-stock company or the cooperative under the single management).

14. ***The participation in irrigation management, including full transfer of management.*** Governments should promote support of participation in management and/or transfer of management on systems' operation improvement and, at the same time, the load on management and services transfer to the users. Participation in the management could be realized in different ways and at different levels (for example, water users association realizes management of on-farm and inter-farm systems by means of participation in water councils at the local administration level or through the total transfer of the management). Because of common lack of experience in management and low profitability of agriculture under the fast introduction of this method latter should be carried out carefully. New management structures should be tested during the preliminary stages of realization. In this connection small schemes are more advantageous candidates for experiment on the entire transfer of management to users. The participation in irrigation management and the entire management transfer to users may precede to the bank investments.

15. ***Chargeable water use.*** Chargeable water use policy should be carried out promoting the reduction of the governmental subsidies on the inter-farm systems management and service. Bank projects should support the entire compensation of management and service costs on the base of the coordinated schedule. However, the compensation of capital investments in dams and inter-farm canals will be fulfilled only when the corresponding cost return, spent for management and service will be reached and farmers incomes will increase.

16. ***Investments at the farm level.*** The Bank financing of on-farm systems reconstruction and land leveling, irrigation equipment, drainage, etc. at the farm level requires mechanisms of credit providing to water users associations or farmers. The alternative approach for Government is the credit provision and its return through the land taxes. Clients should develop methodology of business-plan preparation to define the farm possibilities in credit return and stimulate credit receipt.

17. Alternative farmer investments (the modern methods of surface irrigation, different types of sprinkler irrigation, land leveling, open and close drainage, etc.) by the technical, financial, economic and ecological parameters should be determined and compared.

18. ***An additional activity.*** The main components of the Bank support through of projects include:

• agricultural credit for the necessary deposits;
• middle-term credits for farms mechanization;
• information provision of the farmers (prices, markets, etc.) and additional services.

Beside that the farmers and managers' training, the demonstration of new technologies and irrigation advantages may be included in separate irrigation investment projects.

19. ***The Project preparation.*** The region has defined that adequate financing of works and the project's preparation is significant for providing preparation of the high-quality project. This concerns the preliminary mission on the determination of the project's tasks and in this sense the previous preparation of the project and staff skills are very important.

20. ***New approaches in credit/Instruments.*** It is necessary to work out new methods for credit provision acceleration to prevent further deterioration of irrigation infrastructure and the drainage in the region. For example, the credit on urgent low-cost reconstruction may be given (i) under responsibility of authorities, determining necessary volume of works, planning, design and preparation of the project documents; (ii) investments are defined on the base of alternative criteria, for example, special agreement on maximum accessible expenses per hectare; (iii) approval of annual investment program as well as design and project documents, which preparation is charged on the consultants hired by the Ministry for special purposes. The project preparation consists mainly of simple investment program preparation for one or two administrative units. The credits for study and innovations can also be used for pilot projects having an experimental nature, i.e. the programs of introduction of the management entire transfer, probably with the limited investment component.

21. ***The credit management.*** Mostly crediting for irrigation and drainage system's reconstruction is carried out for the projects under conditions when separate sub-projects should be approved by the Bank on the base of coordinated choice and criteria of correspondence. The region admits that it strengthens control on credit provision.

THE WATER COUNCIL OF THE REPUBLIC OF UZBEKISTAN

The question 14.1 "Problem of water resources rational use in Uzbekistan and measures on its solution"

THESISES OF THE REPORT

1. Rational use of available potable water resources, their management's and protection questions became very important as for all planet so for Uzbekistan.

There is the classification of the water lack depending on the specific water supply per capita: under the resources exceeding 1700 cu. m per capita per year sufficient supply has place; under 1000-1700 cu. m per capita per year – insufficient water supply, causing tense conditions of water use; under 1000 cu. m per capita per year – extreme lack of water, causing unpredictable consequences. Under average annual water consumption equal more than 2 th. cu. m per capita Uzbekistan by this classification belongs to the countries with sufficient water supply, though the lack is felt more and more. At the conference in Rio-de-Janeiro in 1992 the term of necessity "sustainable development of the countries' economics under conditions of resources and water deficit under obligatory following the environment conservation requirements, including water resources protection".

2. Available water resources in Uzbekistan under 90 % of the river flow provision are equal 59.2 cu. km. The main water consumer is the irrigated farming, which in 1997 took 86 % of total quantity of consumed water resources, therefore it has highest possibilities to save water resources. At the same time irrigation together with industry and domestic needs are the main sources of the water pollution, which reduction and prevention significantly depends on water use.

3. The water provision of irrigated lands for last years reduced noticeably. Basing on calculated water consumption, established by "The general scheme of irrigated lands and water resources use and protection in the Republic of Uzbekistan on period till 2005" (Association "Vodproject", 1993) water provision is equal 82 % on average for 1986-1990 and 74 % - for 1991-1997. The significant part of water is withdrawn into collector-drainage network in total all over the republic – near 40 %. This is the result of ineffective water use including unreasonable high losses of water during its conveyance through the canals and on the fields during irrigation.

4. From total volume of water losses near 30 % belongs to on-farm irrigation network. The same – to the inter-farm and main canals and near 40 % - to irrigation.

The common (operational) losses from irrigation network are separated on technical and organizational. The first ones are percolation and evaporation and caused by canals' construction, soil permeability, lining availability. The second ones are the result of non-accordance of water distribution and water calculation mistakes, availability of unproductive releases, support of unreasonable props in the canals caused by absence of command for water allocation. Efficiency values on components are presented in Table 1. An efficiency of mains and inter-farm canals is higher because of hydraulic peculiarities and smaller share of length in the earthen channel. There are few tubes, lined and chute canals in the on-farm network. The perfect types of the canals are applied mainly in a new irrigation zone, therefore here is their highest efficiency.

Water losses on the field depend on the applied methods and irrigation technique. Under the mostly widespread (70 % of the area) furrow irrigation the significant part of the water is lost by percolation and surface release caused by absence of the perfect irrigation means and poor leveling of irrigated plots surface. Only 8 % are irrigated by relatively modern methods of irrigation and the rest – along furrows from the earthen temporary ditches and okaryks by flood and along the stripes. Therefore the irrigation technique efficiency under present conditions is equal 0.67. Low efficiency of irrigation water is also caused by the actual regimes of irrigation. Irrigation standards are exceeded by 2-3 times designed value, correspondingly number of irrigations during growing period is reduced by 2-3 times.

Very important reason of the water losses is breach of established regime of water allocation, because of which some water users feel lack and others users are under water excess increasing irrigation standards, throwing it into collector-drainage network.

High water losses effect significantly groundwater and reclamation situation of lands. High load on drainage formed by water losses, its insufficient capacity and unsatisfactory technical state cause ineffective reclamation regime and high expenses of water for support of leaching irrigation regime and saline lands leaching.

5. Methods of the water use effectiveness increase. The losses' reduction from irrigation network is realized by means of setting of canal's lining and replacement of canals without lining by flumes and tubes within the on-farm irrigation network. Canal's equipment by regulative and water measuring structures promotes the solution of organizational losses' reduction problem.

The water losses reduction on the fields is reached by means of perfectioning of furrow irrigation. Correspondingly to environment-economic conditions it can be replaced by the more perfect methods. An obligatory condition of water losses reduction and improvement of such methods as furrow, irrigation as on stripes and by flood, is a quality leveling of irrigation plots' surface (checks).

The reclamation regimes' optimization supposes such combination of irrigation and drainage, under which desalinization of lands and support of its stable reclamation state is provided under the minimum water expenses per yield unit. Necessary conditions are created by means of water losses reduction for percolation from canals during irrigation reducing the load on drainage.

Perfectioning of the capital and current leaching technology supposes leaching through shortened furrows instead of checks, application of separate norms by tact, deep porosity under the obligatory quality leveling and effective operational regime. Such technology developed by "Sredazgiprovodkhlopok" (now "Uzgipromeliovodkhoz") increases salt-return by 2 times and leaching norm reduction by 1.5-1.7 times.

Exclusion from circulation strongly salinized lands should be realized when it is not possible or unreasonable to desalinize it for technical or economic reason.

Market economy in water management and reclamation can unite all above mentioned ways of the solution of water saving and effective water use problems into single complex.

6. Potential water saving possibilities are estimated on the example of water losses reduction from mains and inter-farm irrigation canals, from on-farm irrigation network due to the perfectioning of irrigation technique. Possible effects and necessary investments are defined for the reconstruction of mains and inter-farm irrigation canals (except of the biggest and specific) and on on-farm systems – canals without lining, irrigating 3.3mln ha; on the same area the perfect technique of irrigation with leveling is being introduced. Potential water losses reduction is illustrated by Table 2. The capital investments necessary to receive meas-

ures' potential effect (in prices of 1991) and its specific value per unit of water losses reduction are presented in Table 3.

7. Recommended water saving measures on period till 2010 are established coming from the fact that potential possibility can not be realized due to technical and economic reasons. Therefore reconstruction of on-farm systems on the area of 639 th. ha and inter-farm canals – near 10 % of potentially necessary ones is being planned. Volumes of the water losses reduction in this case are shown in Table 4.

For realization of recommended measures it is necessary to spend (in prices of 1991) 1420 mln. rubles for the perfectioning of irrigation technique with the capital leveling, 2670 mln. rubles – for the on-farm irrigation network reconstruction and 750 mln. rubles – for the mains and inter-farm irrigation canals' reconstruction. Under this conditions irrigation systems' efficiency will increase all over Uzbekistan to 0.61 against actual 0.58.

Irrigation network reconstruction will allow to raise existing water supply and due to the reduction of losses to reclaim new lands. To save water for reclamation of 1 ha of new lands it is necessary to reconstruct more than 2 ha of existing irrigated lands. Where the modern irrigation network is more perfect and the possibilities of further rising of efficiency are limited, for 1 ha reclamation large area (in Jizak province – more than 10 ha, in SyrDarya province – near 5 ha) should be reconstructed.

8. Reclamation systems' reconstruction is the most radical mean of the joint fulfillment of above-mentioned measures on water saving, especially in such cases, when it is carried out in complex. The main principle of the reconstruction complexity is fulfillment of necessary measures on reclamation systems' perfectioning.

To increase reconstruction's efficiency and realize its potential possibilities it is important to resolve certain organizational and technical questions at the Republic's level. These questions are following: development of special long-term program of irrigated lands' reconstruction with determination of investments' sources; classification of area to be reconstructed; the coordination of construction and the reconstruction of mains and inter-farm collectors with inter-farm reclamation stations; strict report and control over the project indicators achievment on reconstructed objects.

9. Deepening of economic reforms in the Republic's agriculture is directed towards the changes of the land property's forms. Legal base for that will be the following discussed laws' projects: the Land Codex of the Republic of Uzbekistan, the Law of the Republic of Uzbekistan on agricultural cooperative, the Law of the Republic of Uzbekistan on farming management, the Law of the Republic of Uzbekistan on the dekhkan farm. Under these conditions traditional approaches to water saving measures, as to "the state task for the state budget count", should gradually change and further be replaced with the market regulations.

For example, if water losses reduction from mains and inter-farm canals should be realized for state budget count, approach to on-farm network should be different. Already today directions of unification of means and efforts of water and land users themselves should be chosen by means of water reclamating associations establishing with the membership of the farms of different forms of property; gradual transition to paid services under the limited water use in order to perfect technical level and inter-farm systems' operation. All that will demand organizing new or perfectioning of existing bank credit conditions to support agriculture subsidies and credit financing.

10. Technology of water saving increase and agricultural crops yield raising on the base of polymer hydrogels' application (supplementary report).

Polymer hydrogels were synthesized by local institutes and since 1993 laboratory and field investigations are being carried out on their application for the water saving which provides:

Irrigation water losses reduction on 80-90 % for deep infiltration and drainage outflow reduction. At the same time efficiency of fertilizers assimilation by the plants increases due to reduction their withdrawal into groundwater;

Cotton water consumption reduction up to 50 % due to soil and air moisture accumulation. In this connection technology is really competitive with drip irrigation and does not require any special equipment and technical knowledge and hence significant capital investments;

Due to even distribution of moisture in time stress phenomena reduction that allows to increase yield significantly.

The cost of 1 kg of hydrogel is 180-250 soums. Hydrogel is brought in 1 time for 6-8 year, there are no other expenses. Under the norm 50 kg/ha 9000-12500 soums are required for 1 ha or 1500-2100 sum/ha per year, that would be paid under the yield increasing on 0.35 ton/ha and water saving 2700 cu. m/ha for one growing period and labor expenses' reduction.

Table 1

The actual efficiency of irrigation system of Uzbekistan

Administrative unit	Mains and inter-farm network			On-farm network			Irrigation system as a whole		
	technical	organiza-tional	opera-tional	techni-cal	organiza-tional	opera-tional	technical	organiza-tional	opera-tional
SyrDarya basin	**0,84**	**0,98**	**0,82**	**0,83**	**0,93**	**0,76**	**0,70**	**0,92**	**0,62**
Andijan province	0,82	0,98	0,80	0,80	0,89	0,69	0,67	0,87	0,56
Jizzak province	0,91	0,98	0,89	0,90	0,97	0,87	0,82	0,95	0,77
Namangan province	0,84	0,97	0,81	0,81	0,96	0,78	0,69	0,94	0,63
Syrdarya province	0,89	0,99	0,88	0,88	0,96	0,84	0,78	0,95	0,73
Tashkent province	0,81	0,99	0,80	0,80	0,93	0,73	0,66	0,93	0,59
Fergana province	0,80	0,99	0,79	0,80	0,90	0,70	0.65	0.90	0,55
AmuDarya basin	**0,80**	**0,98**	**0,78**	**0,80**	**0,91**	**0,71**	**0,64**	**0,91**	**0,55**
Karakalpakstan	0,77	0,98	0,75	0,76	0,87	0,63	0,59	0,88	0,48
Bukhara province	0,77	0,98	0,75	0,77	0,89	0,66	0,60	0,90	0,50
Kashkadarya province	0,82	0,97	0,79	0,87	0,96	0,83	0,71	0,94	0,65
Navoi province	0,86	0,98	0,84	0,78	0,91	0,69	0,67	0,91	0,58
Samarkand province	0,85	0,98	0,83	0,78	0,95	0,73	0,67	0,94	0,61
Surkhandarya province	0,80	0,99	0,78	0,81	0,92	0,73	0,65	0,92	0,57
Khorezm province	0,81	0,99	0,79	0,78	0,87	0,65	0,64	0,88	0,52
On Uzbekistan	**0,82**	**0,98**	**0,80**	**0,82**	**0,92**	**0,74**	**0,67**	**0,91**	**0,58**

Table 2

Potentially possible reduction of water losses under conditions of irrigation systems' reconstruction

Administrative unit	Irrigated area, th. ha	Losses reduction, mln. m^3				
		Reconstruction area, th. ha	On the fields	In on-farm network	In inter-farm and mains canals	Total
SyrDarya basin	**1910**	**1529**	**2041**	**2324**	**3127**	**7492**
Andijan province	281	280	443	443	582	1468
Jizzak province	293	92	147	89	196	432
Namangan province	280	269	502	361	452	1315
Syrdarya province	299	145	202	165	253	620
Tashkent province	397	391	403	617	797	1817
Fergana province	360	352 .	344	649	847	1840
AmuDarya basin	**2396**	**1777**	**2812**	**3732**	**5545**	**12089**
Karakalpakstan	506	486	557	1221	1655	3433
Bukhara province	277	212	473	523	938	1934
Kashkadarya province	505	184	510	140	793	1443
Navoi province	126	119	129	221	188	538
Samarkand province	377	335	202	511	410	1123
Surkhandarya province	330	194	378	431	714	1523
Khorezm province	275	247	563	685	847	2095
On Uzbekistan	**4306**	**3306**	**4853**	**6056**	**8672**	**19581**

Table 3

Capital investments, necessary for fulfillment of the measures, foreseen by Table 2

Administrative unit	Irrigation technique and capital leveling		Irrigation network		Inter-farm canals	
	Capital investments, mln. rub	Specific capital investments for losses reduction, rub/cu.m^3	Capital investments, mln. rub	Specific capital investments for losses reduction, rub/cu.m^3	Capital investments, mln. rub	Specific capital investments for losses reduction, rub/cu.m^3
SyrDarya basin	**3333**	**1,64**	**6539**	**2,82**	**3191**	**1,02**
Andijan province	631	1,42	1202	2,72	626	1,07
Jizzak province	197	1,34	384	4,31	169	0,87
Namangan province	571	1,14	1177	3,26	569	1,25
Syrdarya province	346	1,70	574	3,47	195	0,77
Tashkent province	835	2,07	1707	2,77	932	1,17
Fergana province	753	2,19	1495	2,30	700	0,84
AmuDarya basin	**4189**	**1,49**	**7456**	**2,00**	**4407**	**0,80**
Karakalpakstan	1428	2,56	1902	1,55	1283	0.77
Bukhara province	449	0,95	807	1,54	733	0.78

Administrative unit	Irrigation technique and capital leveling		Irrigation network		Inter-farm canals	
	Capital investments, mln. rub	Specific capital investments for losses reduction, rub/cu.m^3	Capital investments, mln. rub	Specific capital investments for losses reduction, rub/cu.m^3	Capital investments, mln. rub	Specific capital investments for losses reduction, rub/cu.m^3
Kashkadarya province	351	0,68	767	5,48	591	0,75
Navoi province	269	2,09	503	2,27	117	0,62
Samarkand province	783	3,87	1613	3.16	576	1,40
Surkhandarya province	376	1,00	795	1,84	307	0.43
Khorezm province	598	1,07	1069	1,55	797	0,94
On Uzbekistan	**7522**	**1,55**	**13995**	**2,30**	**7595**	**0,87**

Table 4

Water losses reduction under the reconstruction volume, recommended for realization till 2005-2010

Administrative unit	Reconstruction area, th. ha	Irrigation technique and capital leveling	Irrigation network	Inter-farm canals	Total
SyrDarya basin	**290**	**382**	**396**	**313**	**1091**
Andijan province	36	57	57	58	172
Jizzak province	24	38	23	20	81
Namangan province	49	91	66	45	202
Syrdarya province	42	58	48	25	131
Tashkent province	43	44	25	80	149
Fergana province	96	94	177	85	354
AmuDarya basin	**349**	**592**	**759**	**555**	**1906**
Karakalpakstan	106	121	266	166	553
Bukhara province	64	143	157	94	394
Kashkadarya province	33	91	25	79	195
Navoi province	20	22	31	19	72
Samarkand province	34	20	51	41	112
Surkhandarya province	47	92	104	71	267
Khorezm province	45	103	125	85	313
On Uzbekistan	**639**	**974**	**1155**	**868**	**2997**

Decision on the question 14.1
"The problems of water resources rational use in Uzbekistan and measures on their solution"

Having heard and discussed general report on the question 14.1 Mr. T.Derlyatka (PO "Vodproject"), supplementary report of Prof. S.Mirzayev(TIIIMSH) SPA SANIIRI, Uzgiprovodkhoz, Uzgipromeliovodkhoz representatives being prepared separate questions for the report and the Council members' opinions, the Republican Water Council notes, that the problem of available water resources use and management in Uzbekistan is coming into new phase, characterized by the following:

An entire exhaustion of available water resources, practical stability in time of its quantitative indicators (volumes) and deterioration of the qualitative indicators, besides that the water use per capita under population increase will reduce steadily up to minimum critical level;

The most part (85 %) of available water resources of Uzbekistan belongs to its share in two international rivers AmuDarya and SyrDarya, that causes additional difficulties and problems in the interstate water allocation;

There is direct and indirect effect of Aral Sea desiccation and as a result ecological crisis in Aral coastal zone and in a whole sea basin on the water-related sector.

To solve these problems five Central Asian states' Presidents at the meeting in 1993 have coordinated the main principles of interstate water allocation on two river basins. For these principles practical realization it was decided to organize ICWC (Interstate Coordination Water Commission) with Secretariat and SIC (Scientific-Information Center) as well as two BWO (Basin Water Organization) of AmuDarya and SyrDarya under ICWC. Time and practice showed their necessity, but their activity is not sufficient:

Solution of water allocation and water use problems by young Central Asian states is accompanied by their economics transition to market mechanisms, that demands another approach in their interrelations;

The market mechanisms start to penetrate in management and water allocation field at the level of public, dekhkan and farmer enterprises by means of creation of water users associations or cooperatives, functioning for account water and land users themselves. Unfortunately, Uzbekistan really lags behind in these questions from the countries-neighbours (Kazakhstan, Kyrgyzstan);

Certain work is carried out in Uzbekistan on regulation of water use and water allocation (together with the technical and organizational measures) on the base of available water resources limitation on irrigated areas and intensification of qualitative indicators, taking into consideration actual conditions and possibilities of the Republic's every region. This allowed for last 10-15 years to reduce average specific water consumption from 17.5 up to 11-11.5 th. cu. m. The further reduction of specific water consumption in irrigated farming is possible only on the base of reliable scientific recommendations, including new technologies (sawing under the polyethylene film, hydrogels, etc.);

Considered at XI session of Oliy Majlis of the Republic of Uzbekistan four laws (Land Codex of the Republic of Uzbekistan, "About cooperative farms", "About farmer farms", "About dekhkan farms") directed to different types of land property and forms of agricultural production organization, while they are realized in practice, will effect existing methods of water use and water allocation at all levels;

Development of interstate water allocation legal base with regard to individual peculiarities of every state of the region, as well as national strategy in the available water resources use, keeping interests of neighbouring states and ecological requirements, lags behind that

may cause big problems and difficulties under extreme situation, for example, related to the year humidity (strong shortage of water or, on the contrary, unexpected floods on the main interstate rivers);

Taking all this into consideration, Water Council of the Republic of Uzbekistan makes the following decisions:

1. To take into account the report, prepared by PO "Vodproject", Department for Water Resources Balance of Minselvodkhoz, SPA SANIIRI, "Uzgiprovodkhoz", "Uzgipromeliovodkhoz" and the TIIIMSH supplementary report.

2. To note that works fulfilled by PO "Vodproject" within the "General scheme of irrigated farming and water management of Uzbekistan development" are worth to be taken into consideration. Water Council is sure that as 2nd stage should be completed up to the level of "State program of water saving in Uzbekistan on the period till 2025" according with interests and obligations of all economy branches and regions. This program should include not only quantitative and qualitative indicators of water saving, methods and mechanisms of its realization on branches and regions, but all types of actual sources of expenses covering with due regard to the market relations.

3. Water saving in economy under obligatory following ecological requirements under reducing available water resources being the main source of potable water demands the constant broadening and development of the scientific investigations and design works. The most perspective and valuable for further development are the following aspects containing water saving effect:

a) in the field of interstate rivers hydrology:

the perfectioning of water calculation (in quality and quantity) along the river channels under different technological schemes of water measuring in order to clarify flow and channel losses (differing on certain gauging stations to 10-15 % of river flow), including improvement of hydrometric posts and stations' modern equipment;

analysis of rivers hydrograph under different year humidity according to the water reservoirs' operation regime in the upper reaches to set optimum regime, satisfying concerned states' requirements;

b) in the field of traditional water saving measures:

traditional low-cost most preferable water saving measures are as follow:

development of new ways and forms of water use and water allocation organization applied to the different forms of agricultural production (cooperative farms, dekhkan farms; their combination as a water use unit) on the base of well known methods perfectioning such as water supply to farms, including water circulation between farms, night time irrigation use, etc.;

to perfect the technique and technology of surface irrigation with help of optimization of the elements of furrow irrigation technique in combination with the increasing of the leveling accuracy applied to the different soil-climatic conditions of the regions; to prepare practical recommendations for the dekhkan and farmer enterprises on furrow irrigation elements and organizing irrigation itself in new conditions;

c) in the field of investigation in water consumption by leading crops (cotton, grain under irrigation):

clarification of leading crops biological water demands in different water allowance regions in dependence of their yield on the base of wide-scale monitoring and laboratory experiments;

continuation of investigations on the leading crops water consumption in conditions of soil salinization and different mineralization of irrigation water in connection with their yield;

d) in the field of land reclamation and saline water use for irrigation:

to revise scientific bases of drainage and drainage systems construction as a factor of

land reclamation and the technical base of saline land leaching in the changed conditions (lack of water resources, progressive deterioration of water quality, drainage operation and maintenance costs increase);

to work out new and perfect existing technologies of saline land leaching, including such as "soil leaching on furrows" ("Uzgipromeliovodkhoz");

to revise previous investigations and recommendations on collector-drainage saline water as well as groundwater taking into account progressive lack of water and environment deterioration, including water itself;

e) in the field of economic and organizational measures on water saving:

to revise existing water pricing introduction in irrigated farming, its completion and development taking into account new forms of land property and agricultural production organization on these lands as well as other conditions. The purpose of that work should be pilot introduction of chargeable water use in certain regions of the Republic at the level of farms with different forms of land property;

the perfectioning of approaches to organization of pilot introduction of associations (societies) of land and water users with a scope of the different forms of farming in order to transfer to them on-farm irrigation and collector-drainage network;

f) in the field of non-traditional measures on water saving:

organization of methodologically based experiments and monitoring in laboratory and field conditions during crop growing under film in order to estimate objectively this new technology of water saving.

Scientific development and perfectioning of above mentioned aspects are sufficient for forming independent scientific-technical program.

To ask Minselvodkhoz (Mr. A.A.Jalalov) with the participation of organizations concerned as well as other ministries and departments presented in Water Council, to form corresponding program ("Water resources and development of water saving scientific base following environment protection requirements for sustainable development of economy of the Republic of Uzbekistan in XXI century").

4. Water crisis should be reminder for everyone who is responsible for planning, development and rational consumption of available water resources. Though in Uzbekistan on average annual water consumption per capita is 2500 cu. m, in certain provinces this indicator is significantly less (1200-1300 cu. m in Navoi and Samarkand provinces) that is indeed troublesome factor.

5. The water lack is a result of many factors impact, including, in the first turn, water unproductive use, deterioration of available stores' quality as a result of their pollution, etc. Quality is deteriorated gradually, aggravating tense balance of water resources used for irrigation and ecological conditions.

It is very important to work out a new approach to the problem of water resources use solution:

to cultivate understanding of water as a natural object among wide strata of population;

to get integrated solution of the quantitative and qualitative aspects of the complex water use problem;

to unite in a single whole land use and efficient water resources consumption (an objective beginning in organizational-structural plan was put by unification of two initially independent ministries);

to admit the fact of gradual acquisition of economic property status by the water and encourage measures on its efficient use;

to support new developments and approaches introduction, supposing all interested

sides participation.

6. An immediate and important measure becomes development of the Republican or National Strategy of the available water resources management and use in the interests of economy branches for a period till 2025, based on the systems principles. This development should be organized on the base of State Committee on the Science and Technics with possible participation of foreign sponsors carrying out competitive selection of participants, charging SPA SANIIRI as an organizer.

7. The perspective development of the Republic economy is directly related with water saving problem. This problem touchs the interests of economy branches, administrative areas, every resident of the Republic. Therefore, all aspects of this problem should have the legal base. In relation with that the Water Council recommends to start the works on the development of the draft law of the Republic of Uzbekistan on the water saving, organizing the working group of specialists of Minselvodkhoz, Minenergo, Goskompriroda, Minkomobsluzhivaniye and other ministries concerned preliminarily coordinating this question with the corresponding Committee of Oliy Majlis.

8. The supplementary report on the question "Water saving technology and increasing of agricultural crops yield on the base of polymer hydrogels application". To accept the offer on the continuation of production investigations in different soil-climatic zones (on the area of Uchkhoz of TIIIMSH, on the pilot plots of UzNIHI, SANIIRI and others). The responsible executive agency will be TIIIMSH, with attraction of TashHTI, SPA "Biolog", SPA SANIIRI, UzNIHI and IVP.

Taking into account importance of hydrogels production to submit to the Cabinet of Ministers of the Republic of Uzbekistan the offer on establishing of special plant for production of hydrogels under administration of Navoi Chemical Combinate. TIIIMSH to prepare appropriate letter (Council member Mr. S.Mirzayev).

9. The Republican Water Council of Minselvodkhoz appeals to another ministries and departments, whose representatives participate in this Council, with the request to discuss the water saving perspective as important state measure in order to work out real ways and measures applied to any branch.

10. Taking into consideration big concern of the Republican Water Council members of perspectives of water resources of Uzbekistan use and protection to charge the Council members group (the editorial group as follow: Mr. V.Antonov, Mr. V.Dukhovny, Mr. S.Mirzayev, Mr. P.Shermukhamedov, Mr. A.Kadyrov) to prepare the project "Appeal of the Water Council of the Republic of Uzbekistan to all farmers, water specialists of all branches, all population of the Republic" with the description of the present situation and the perspectives of available water resources of the Republic and their use. To discuss the prepared project at the next meeting of the Council for publication in newpapers "Kyshlok Khayoty" and "Selskaya Zhizn".

11. The control over this decision fulfillment to put on the Council's member Mr. B.Yusupov, the chief of the Department of Water Resources Balance of Minselvodkhoz.

The Chairman of the Republican
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A.Jalalov

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