Interstate
Coordination
Water
Commission
of Central Asia

BULLETIN No 1 (26)

April 2001

CONTENT

Protocol No 28
of ICWC meeting of Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan and Uzbekistan

December 21-22, 2000 Ashgabat

ICWC members

A.M. Ramazanov	Chairman, Committee for Water Resources of the Ministry of Natural Resources and Environment of the Republic of Kazakhstan
B.T. Koshmatov	Deputy Minister, Director General, Water Department of the Ministry of Agriculture of the Kyrgyz Republic
S.Sh. Shoimardonov	Deputy Minister of Reclamation and Water Management of the Republic of Tajikistan
S.K. Kurbanov	Minister of Water Management of Turkmenistan
A.A. Jalalov	First Deputy Minister of Agriculture and Water management of the Republic of Uzbekistan

From IFAS

T.A. Altiyev	Chairman EC IFAS

From ICWC bodies

Yu.H. Khudaibergenov	Head BWO “AmuDarya”
O.G. Lysenko	Head, BWO “AmuDarya” Department
M.H. Khamidov	Head BWO “SyrDarya”
A.I. Leshansky	Head BWO “SyrDarya” Department
V.A. Dukhovny	Director SIC ICWC
P.D. Umarov	Deputy Director SIC ICWC

Invited

R.K. Ikramov	Director General SPA "SANIIRI"
H. Pulatov	Director “Yugvodkhoz”
A.K. Kutzhanov	Director “Kyzylordavodkhoz”
A.Sh. Jailobayev	Head of Department, Ministry of Agriculture and Water Management of the Kyrgyz Republic
A.E. Bekenov	Chief Engineer “Kyrgyzsuvdlboor”
D.D. Nurbayev	Deputy Director SANIIGMI
A.Ch. Ovezov	Head of Department, Ministry of Water Management of Turkmenistan

Meeting was chaired by Minister of Water Management of Turkmenistan S.K. Kurbanov.

AGENDA

1. About results of vegetation period 2000 (responsible BWO "AmuDarya" and BWO "SyrDarya")

2. Water diversion limits for non-growing period of 2000-2001 in AmuDarya and SyrDarya basin consideration (responsible BWO "AmuDarya" and BWO "SyrDarya"). Water reservoir cascade on AmuDarya and SyrDarya operation regime as a proposal to interstate agreement on SyrDarya water and energy resources rational use.

3. BWO "SyrDarya" activity during growing period 2000 consideration.

4. About ICWC development and strengthening program (resp. SIC ICWC)

5. Program of ICWC and its executive bodies financial activity for 2001:

- O & M financing plan;
- design work plan;
- SIC ICWC and its branches research plan (responsible BWO "AmuDarya" and BWO "SyrDarya", SIC ICWC)

6. About draft "Provision on BWO, SIC and ICWC Secretariat financing" (responsible SIC ICWC)

7. About interaction strengthening between water management organizations and Hydrometservices on amplification of river flow and hydrological forecast in Central Asia

8. Additional question (submitted by SIC ICWC): about ICWC and FAO technical collaboration project (resp. SIC ICWC)

9. About agenda and place of the next 29th ICWC meeting.

Have heard participants' reports and exchanging opinions ICWC members have decided:

On the first question

1. To accept BWO "AmuDarya" and BWO "SyrDarya" information about water intake limits realization and established cascade regime provision on AmuDarya and SyrDarya during growing period 2000.

2. ICWC members to take into account, whilst water use plan of 2001 preparation, lessons learned during dry year 2000, to undertake necessary measures for water sector readiness improvement for similar phenomena in the future.

3. BWO "AmuDarya" and BWO "SyrDarya" to take measures on even water distribution between water users.

On the second question

1. To approve water intake limits from AmuDarya and SyrDarya river (Annex 1, 2) and reservoir cascade regime on AmuDarya river for non-growing period of 2000-2001 Annex 4) and water supply to the Aral Sea and coastal zone (Annex 1, 2).

2. Recommend operation regime of Naryn-SyrDarya cascade during non-growing season of 2000-2001 (Annex 3) as a proposal for preparation of two- and three-sided interstate agreements on water-energy resources rational use in the SyrDarya basin. ICWC member from Kazakhstan, Kyrgyzstan, Tajikistan and Uzbekistan to promote conclusion of those agreements in January 2001.

On the third question

1. ICWC member from Kazakhstan Mr. A.M. Ramazanov offered draft decision as follow:

1.1. To recognize BWO "SyrDarya" activity on even water supply of all water users during growing period of 2000 insufficient.

1.2. To fire BWO "SyrDarya" Head Mr. M.K hamidov.

1.3. To consider necessary periodically (once in 5 years) rotate BWO "SyrDarya" leadership with nomination on this position representatives of Kazakhstan, Kyrgyzstan, Tajikistan and Uzbekistan and introduce appropriate amendments in BWO "SyrDarya" status.

2. Proposal of Kazakhstan is supported in items 1.1 and 1.2 by Kyrgyzstan and Tajikistan; in items 1.3 by all ICWC members.

3. Following consensus on item 1.3, ICWC members to prepare proposals on given question with regard for rotation principle for two BWOs. SIC ICWC together with BWOs to summarize and include in draft status of BWOs for discussion at the next ICWC meeting.

On the fourth question

1. SIC ICWC proposals on ICWC activity's main directions and development program improvement to accept for consideration and ICWC members at 01.02.2001 to prepare suggestions on ICWC activity development and strengthening as well as on creation of thematic groups from representatives of 5 countries.

2. ICWC members to continue work on developed agreements' text improvement and accelerate their submitting to ICWC meeting.

On the fifth question

1. To approve cost estimates for operational needs of BWO "AmuDarya" and BWO "SyrDarya" for 2001.

2. Taking into account, that SIC ICWC plan for 2000-2002 has been approved at 25th ICWC meeting, to approve its cost estimate for 2001;

3. To approve SIC ICWC cost estimate for 2001 with regard for proposal of ICWC member from Kyrgyzstan Mr. B. Koshmatov about amplification of SIC ICWC Kyrgyz branch expenses.

4. ICWC members to take measures for providing full financing of above activity.

On the sixth question

To accept proposal of ICWC member from Kyrgyzstan Mr. B. Koshmatov and to consider question 6 at the next ICWC meeting.

On the seventh question

1. To recommend to Hydrometservices of Central Asia within a month to agree and prepare proposals on rehabilitation of key weather and gauging stations, prepare cost estimates and define share of each country and order of financing.

2. ICWC members together with Hydrometservices to prepare suggestions to the governments for determining sources of financing on item 1.

3. To ask Hydrometservices leadership, taking into account complicated awter related situation, to March 1, 2001 to prepare monthly forecast for AmuDarya and SyrDarya water availability on growing period of 2001.

4. To invite to next ICWC meeting Hydrometservices leaders to strengthen their interaction with water management organizations in the region.

On eighth (additional) question

1. To adopt activity conducted by SIC ICWC together with national organizations on FAO involvement in the project directed at irrigated farming productivity improvement in the Aral Sea basin. To agree with the text of agreement between FAO and ICWC and principle equal financial means distribution between the states.

2. To commission SIC ICWC Director Prof. V. Dukhovny to sign this agreement on behalf of ICWC and organize jointly with FAO representatives fulfillment of conditions set by FAO.

3. ICWC members to appoint the project national coordinators and support development of this activity in Extension service.

4. SIC ICWC Director Prof. V. Dukhovny within a month to agree with ICWC members the project budget.

On the ninth question

Next 29th ICWC meeting to carry out in the Republic of Kazakhstan in March 2001.

AGENDA
of the next 29th ICWC meeting
in the Republic of Kazakhstan in March 2001

1. Reservoir cascade operation regime and water intake limits in AmuDarya and SyrDarya basin amplification for the growing period of 2001 (resp. BWO "AmuDarya" and BWO "SyrDarya")

2. About the project "About order of financing ICWC executive bodies (BWOs, SIC ICWC, Secretariat) (resp. SIC ICWC)

3. Consideration of program of ICWC activity development and strengthening (resp. SIC ICWC)

4. About strengthening water related bodies and Hydrometservices interaction on AmuDarya and SyrDarya river flow forecast amplification.

5. About agenda and place of the next 30th ICWC meeting.

For the Republic of Kazakhstan	A. Ramazanov
For the Kyrgyz Republic	B. Koshmatov
For the Republic of Tajikistan	S. Shaimardanov
For Turkmenistan	S. Kurbanov
For the Republic of Uzbekistan	A. Jalalov

Appendix 1
to ICWC meeting protocol No 28
in Ashkhabad on December 21-22, 2000

Water intake limits from AmuDarya river
and water supply to the Aral Sea and river delta
for non-growing period 2000-2001

River basin, state	Water intake limits for non-growing period (from 01.10.00 to 01.04.01)
Total from AmuDarya river	12.292
including:	
The Republic of Tajikistan	2.308
The Kyrgyz Republic	0.000
From AmuDarya river to Kerky gauge	9.984
Turkmenistan	5.200
The Republic of Uzbekistan	4.784
Besides:	
- water supply to Aral Sea coastal zone taking into account irrigation releases and collector-drainage water	1.600
- sanitary-ecological releases to irrigation systems:	0.640
of Dashkhovuz veloyat	0.120
of Khorezm veloyat	0.120
of the Republic of Karakalpakstan	0.400

Note: Water intake limits suppose water supply for irrigation, industrial-municipal and other needs. Under changing of basin water availability water intake limits will be appropriately corrected.

Appendix 2
to ICWC meeting protocol No 28
in Ashkhabad, on December 21-22, 2000

Water intake limits from SyrDarya River
and water supply to Aral Sea and river delta
for non-growing period 2000-2001

River basin, state	Water intake limits for non-growing period (from 01.10.00 to 01.04.01)
Total from SyrDarya river	3.07
including:	
The Republic of Kazakhstan	0.50
The Kyrgyz Republic	0.02
The Republic of Tajikistan	0.20
The Republic of Uzbekistan	2.35
Besides:	
water supply to Aral Sea coastal zone taking into account irrigation releases and collector-drainage water	2.10

Note: Water intake limits suppose water supply for irrigation, industrial-municipal, and other needs. Under changing of basin water availability water intake limits will be appropriately corrected.

Appendix 3
to ICWC meeting protocol No 28
in Ashkhabad on December 21-22, 2000

REGIME
of Naryn-SyrDarya water reservoirs cascade operation
for period from October 1, 2000 till March 31, 2001

	Measurement unit	October	November	December	January	February	March	Total
		actual	Actual					mln.m^3
Toktogul water reservoir								
Inflow to water reservoir	m^3/s	297	258	220	152	150	160	
	mln m^3	795	669	589	407	363	429	3252
Volume: Beginning of period	mln m^3	13705	13447	12913	12160	10960	10185	
End of period	mln m^3	13447	12913	12160	10960	10185	9676	-
Release from water reservoir	m^3/s	383	469	500	600	470	350	
	mln m^3	1026	1216	1339	1607	1137	937	7262
Kairakkum water reservoir								
Inflow to water reservoir	m^3/s	653	807	1099	918	798	591	
	mln m^3	1749	2092	2944	2459	1931	1583	12757
Volume: Beginning of period	mln m^3	1002	1736	2462	3365	3418	3418	
End of period	mln m^3	1736	2462	3365	3418	3418	3418	-
Release from water reservoir	m^3/s	416	630	800	923	819	610	
	mln m^3	1114	1633	2143	2472	1981	1634	10977
Chardara water reservoir								
Inflow to water reservoir	m^3/s	333	662	952	1067	1017	770	
	mln m^3	892	1716	2550	2858	2460	2062	12538
Volume: Beginning of period	mln m^3	757	1080	1573	3159	5064	5400	
End of period	mln m^3	1080	1573	3159	5064	5400	5400	-
Release from water reservoir	m^3/s	247	483	350	350	350	600	
	mln m^3	662	1252	937	937	847	1607	6242
Release in Kzylkum canal	m^3/s	5	1	5	5	5	5	
	mln m^3	13	3	13	13	12	13	68
Release in Arnasay sink	m^3/s	0	0	0	0	522	160	
	mln m^3	0	0	0	0	1263	429	1691
Water supply to Aral Sea	m^3/s	18	138	174	144	154	157	2100
Charvak water reservoir								
Inflow to water reservoir (total of 3 rivers)	m^3/s	123	106	92	63	60	79	
	mln m^3	329	275	246	169	145	212	1376
Volume: Beginning of period	mln m^3	503	584	652	737	744	743	
End of period	mln m^3	584	652	737	744	743	748	-
Release from water reservoir	m^3/s	91	72	60	60	60	77	
	mln m^3	244	187	161	161	145	206	1103
Andijan water reservoir								
Inflow to water reservoir	m^3/s	101	127	85	50	50	61	
	mln m^3	271	329	228	134	121	163	1246
Volume: Beginning of period	mln m^3	305	493	754	922	1035	1126	
End of period	mln m^3	493	754	922	1035	1126	1223	-
Release from water reservoir	m^3/s	30	27	22	8	12	25	
	mln m^3	80	70	59	21	29	67	327

Appendix 4
to ICWC meeting protocol No 28
in Ashkhabad on December 21-22, 2000

SCHEDULE
of Nurek and Tuyamuyun water reservoirs
for period from October 2000 till March 2001

Nurek water reservoir	Measure-ment unit	Actual		Forecast				Total
		October	November	Dec	Jan	Feb	March	
Inflow	m^3/s	314	241	190	160	149	176	3233
Water losses	m^3/s	6	6	0	-2	4	0	33
Volume: for beginning of period	mln m^3	10098	9824	9299	8309	7188	6329	10098
for end of period	mln m^3	9824	9299	8309	7188	6329	5821	5821
Accumul. (+), release (-)	mln m^3	-274	-525	-990	-1121	-859	-508	-4277
Mark: end of period	m	903,48	898,118	887	873,35	862,20	854,9	
Release from water reser-voir	m^3/s	410	438	560	580	500	366	7477

Tuyamuyun water reser-voir	Measure-ment unit	Actual		Forecast				Total
		October	November	Dec	Jan	Feb	March	
Inflow	m^3/s	407	385	463	633	591	569	7977
Water losses	m^3/s	89	67	35	133	255	171	1961
Volume: for beginning of period	mln m^3	1820	1833	2245	3038	4035	4367	1820
for end of period	mln m^3	1833	2245	3038	4035	4367	3368	3368
Accumul. (+), release (-)	mln m^3	13	412	793	997	332	-999	1548
Mark: end of period	m	117,95	123,3	123,7	125,8	126,5	124,3	
Release from water reser-voir	m^3/s	313	158	132	128	200	771	4490
Release in river	m^3/s	162	123	110	110	150	466	2955

ABOUT RESULTS OF GROWING PERIOD 2000 IN AMUDARYA RIVER BASIN

(Information on the first issue of ICWC meeting agenda)

In general favorable water-economic conditions for non-growing period 1999-2000 in AmuDarya river basin allowed basin states to carry out leaching and recharge irrigation successfully.

In the same time because of range of reasons optimal water supplies couldn't be formed in basin reservoirs by the end of non-growing period.

Actually, existing water resources opportunities on creating maximum optimal water supplies in basin reservoirs were not used.

a) For the beginning of vegetation period 2000 water volumes in Nurek reservoir were 5773 mln.m^3 under plan 3611 mln.m^3. Water shortage in Nurek reservoir was 191 mln.m^3.
b) In spite of preventive measures undertaken by Minselvodkhoz of the Republic of Uzbekistan and BWO "AmuDarya" in March 2000 and directed to maintain water volumes in Tuyamuyun reservoir at level at least 4000 mln. m^3, because of very low actual inflow in March, water volumes in this water reservoir for 01.04.2000 were 3611 mln.m^3. Last year in this time in Tuyamuyun reservoir 4452 mln. m^3 were accumulated. In result water shortage in this water reservoir was 841 mln. m^3.
c) Over main in-system AmuDarya river basin reservoirs total water amount was 3395 mln.m^3 or water shortage comparing to last year for the beginning of growing period was 457 mln.m^3.

Such situation with accumulation of optimal water supplies in basin reservoirs was formed mainly on following reason.

Rather satisfying water availability during recent years calmed down water consumers of the region. River basin states having sufficient experience of agricultural production in low water conditions, observed in the basin last 20-25 years, couldn't estimate beforehand extent of upcoming low water period vigorousness, take appropriate preventive measures in time, not foreseeing any negative consequences in future vegetation.

Actual water resources supply in basin reservoirs by the beginning of vegetation period and preliminary water availability forecast for vegetation period that on average was within 93.0% didn't become a reason for special alarm in the region.

Initial water-economic conditions (water availability forecast, water stores in reservoirs) by the beginning of growing period 2000 on their parameters were closer to low water period and forecasted water availability was expected to be within 41.1-47.4 km^3 (86.4-99.7%) or on average 93.0% of norm.

However, actual water availability in Kerky gauge upstream Garakum canal for growing period found out to be rather lower than forecasted one and was only 34.182 km^3 under norm 47.592 km^3 or 71.8 %.

But it also didn't correspond to frameworks of given by Uzgydromet forecasts for all growing period 2000. Actual fluctuation from boundary values of preliminary forecasts was 93.0 - 71.6 = 21.4 %, 106,3 - 71.6 = 34.7 %, from main forecast 14.8-28.1 %.

Monthly dynamics of water availability in Kerki gauge upstream Garakum canal is given in Table 1.

Table 1

Name	April	May	June	July	August	September	Period
Norm, m^3/s	1640	2670	3800	4520	3470	1950	47592
Actual 2000, m^3/s	1401	2560	2379	2673	2398	1522	34182
Availability	85,4	95,9	62,6	59,1	69,1	78,1	71,8

Similar low water conditions in basin and abnormal water-economic situation haven't being observed in the region for last 20 years.

Increased water availability forecast for growing period 2000 was negatively reflected on timeliness of necessary decisions taken by states in issues of water management and agriculture policy in region.

Actual water flow in above-mentioned gauge was extremely low that is 28.3 km^3 relatively to last decades (for reference approximately under normal water availability flow in this gauge is about 42.0 km^3). In 1997 low water year actual flow in Kerki gauge upstream Gargumdarya canal was 35.7 km^2, in 1995 it was equal to 38.6 km^3. Similar hard low water situation in AmuDarya river basin hasn't been observed for a long time.

States of region during vegetation jointly with BWO "AmuDarya" took measures on regulation of water discipline, intensification of river water intake control including pumping stations. Special joint control groups were formed. In middle reaches of river water intakes reduction was fulfilled to transport water to Tuyamuyun hydrounit. The same measures were carried out in lower reaches of river to transport water Takhiatash hydrounit. Taken measures gave certain effect on rational and economical water use in region.

Results of established water intake limits use for reported vegetation period by states located in AmuDarya river basin are given below:

1. The Kyrgyz Republic used 9.9 % established limit under limit 0.450 km^3, actual was 0.0446 km^3.
2. The Republic of Tajikistan used 84.2 % established limit for reported vegetation period under limit 6.946 km^3, actual was 5.848 km^3.
3. The Republic of Uzbekistan used 63.8% established limit under limit 15.247 km^3, actual was 9.372 km^3.
4. Turkmenistan used 68.6 % established limit under limit 15.5 km^3, actual was 10.629 km^3.
5. In total over basin vegetation water intake limit was used on 68.8% under water intake limit 38.143 km^3, actual was 26.255 km^3.

Over river sites established water intake limits use is following:

1. The Kyrgyz Republic - 9.9 %;
2. Upper reaches - 84.2 %;
3. Middle reaches - 82.8 %, including the Republic of Uzbekistan - 88.1 %, Turkmenistan - 80.0%;
4. Lower reaches - 48.4 %, including the Republic of Uzbekistan - 50.0 %, Turkmenistan - 45.4 %.

Water availability of three main water consumers in lower reaches of the river for reported period was formed in following way:

1. Khorezm - 64.2 %;
2. Dashoguz - 45.4 %;
3. The Republic of Karakalpakstan - 42.7 %.

Plan of water supply to the Aral Sea and river delta was fulfilled on 20.46 % under plan 3000 mln. m^3, actually supplied 614.0 mln. km^3.

Practically for the first time for last ten years by the beginning of vegetation (2000-2001) required planned water resources supply couldn't be formed in Nurek reservoir in amount 10 bln. 540 mln. m^3, actually for 01.10.2000 water volume in this water reservoir was 10 bln. 98 mln. m^3 or delay from accumulation schedule in amount 450 mln. m^3.

By 01.10.2000 over in-system water reservoirs 2050 mln. m^3 was accumulated. In comparison with last year accumulation schedule delay was allowed in amount 400 mln. m^3.
In connection with low inflow to TMHU:

To 01.06.2000 effective volumes of Tuyamuyun water reservoir were completely released;

More than four months water resources allocation in lower reaches was completely carried out directly in percentage ratio depending on inflow to Tuyamuyun water reservoir;

For 01.10.2000 water amount in Tuyamuyun reservoir were 1820 mln. m^3 or release of reservoir dead volume was allowed on 380 mln. m^3, last year by this date 3684 mln. m^3 was accumulated.

In conclusion BWO "AmuDarya" proposes to approve submitted for ICWC members consideration summary reports on water intake limits for vegetation period 2000.

Tables 2-4 are enclosed to this report.

Table 2

Established water intake limits use
for growing period 2000 in AmuDarya river basin

Items	Limit	Actual	Over-intake	Water saving	Percent of fulfillment
The Kyrgyz Republic	450	44,6		405,4	9,9
The Republic of Tajikistan	6946	5848,5		1097,5	84,2
The Republic of Uzbekistan, in total:	**15247**	**9732,4**		**5514,6**	**63,8**
including:					
a) Water intakes middle stream					
Karshi MK	2700	2452		248	90,8
AmuBukhara MK	2832	2422,8		409,2	85,6
Total middle stream:	5532	4874,8		657,2	88,1
б) Water intakes downstream					
Khorezm oblast	3315	2126,9		1188,1	64,2
The Republic of Karakalpakstan	6400	2730,7		3669,3	42,7
Total downstream	9715	4857,6		4857,4	50,0
Turkmenistan, in total:	**15500**	**10629,3**		**4870,7**	**68,6**
including:					
a) Water intakes middle stream					
Garagum canal	7482	5948,2		1533,8	79,5
Lebap veloyat	2897	2353,7		543,3	81,2
Total over middle stream	10379	8301,9		2077,1	80,0
b) Water intakes downstream					
Dashoguz veloyat.	5121	2327,4		2793,6	45,4
Total over basin	**38143**	**26254,8**		**11888,2**	**68,8**
including:				0	
The Kyrgyz Republic	450	44,6		405,4	9,9
Upstream	6946	5848,5		1097,5	84,2
Middle stream	15911	13176,7		2734,3	**82,8**
Downstream	14836	7185		7651	48,4
Besides Surkhandarya veloyat	**1000**	**1316**	**-316**		**131,6**
Water intakes of AmuDarya downstream, in total:	**14836**	**5362,4**		**9473,6**	**36,1**
including:					
Khorezm oblast	3315	2126,9		1188,1	64,2
The Republic of Karakalpakstan	6400	2730,7		3669,3	42,7
Dashoguz veloyat.	5121	2327,4		2793,6	45,4

Table 3

Actual Nurek and Tuyamuyun water reservoirs operation regime
for period since April 2000 till October 2000

Nurek water reservoir	Measure-ment Unit	Actual						Total
		April	May	June	July	August	September	
Inflow	m^3/s	482	920	964	1279	1204	746	14797
Water losses	m^3/s	0	0	0	2	0	11	32
Volume: for the beginning of period	mln m^3	5773	6003	6605	7113	8094	9608	5773
for the end of period	mln m^3	6003	6605	7113	8094	9608	10098	10098
Accumul. (+), release (-)	mln m^3	230	602	508	981	1514	490	4325
Mark: end of period	m	857,56	865,8	872,41	884,45	901,18	906,12	
Release from water reservoir	m^3/s	393	695	768	912	639	546	10440

Tuyamuyun Water reservoir	Measure-ment Unit	Actual						Total
		April	May	June	July	August	September	
Inflow	m^3/s	302	928	847	1096	664	516	11515
Water losses	m^3/s	56	336	293	308	113	74	3125
Volume: for the beginning of period	mln m^3	3611	2816	2570	1921	1914	1858	3611
for the end of period	mln m^3	2816	2570	1921	1914	1858	1820	1820
Accumul. (+), release (-)	mln m^3	-795	-246	-649	-7	-56	-38	-1791
Mark: end of period	m	117,05	122,44	117,32	118,1	117,7	117	
Release from water reservoir	m^3/s	552	684	804	790	571	457	10181

Table 4

Water supply to Aral Sea and AmuDarya river delta
for April-June of growing period 2000

Items	April	May	June	July	August	September	Water supply from 01.04. to 01.10.00 г.		Percent of fulfillment
							plan	actual	
Samanbay gauge	68	63	49	14	15	12	2000	221	11,05
Total release from System of canals Kyzytken and Suenly	0	0	0				0	0	
CDS	127	78	88	48	27	25	1000	393	39,3
TOTAL:	195	141	137	62	42	37	3000	614	20,5
Increment	195	336	473	555	577	614			

ABOUT RESULTS OF GROWING PERIOD 2000 IN SYRDARYA RIVER BASIN

(Information on the first issue of ICWC meeting agenda)

Completed growing period 2000 diversified by low water availability was a serious test of transboundary water resources management process reliability in SyrDarya river basin as well as checking work of all water sector of region. Water shortage turned out to be more significant than it had been expected; therefore it meant restriction of initial conditions of mentioned sector functioning.

In Table 1 comparison of following seasonal indicators was fulfilled - actual water resources, average annual indicators (or norm), and expected resources according to hydrometservices assessments (forecast).

Table 1

SyrDarya river basin water resources in growing period 2000

Parameter (from 1.04 to 30.09.2000)	mln m^3			%%	
	Norm	Forecast	Actual	Norm	Forecast
Inflow in upstream water reservoirs:					
Toktogul	9392	9960	9059	96	90
Andijan	2903	2530	1010	34	40
Charvak	5112	4348	3821	75	88
Ugam river	522	474	377	72	80
Subtotal	**17929**	**17312**	**14267**	**80**	**82**
Lateral inflow:					
Toktogul-Uchkurgan	1157	1154	1030	89	89
Uchkurgan, Uchtepe-Kairakkum	3621	3004	2361	65	77
Andijan-Uchtepe gauge	2435	2213	2250	92	101
Kairakkum-Chardara	3181	2609	1484	47	57
Gazalkent-Chinaz-Chirchik gauge	979	790	563	57	73
Subtotal	**11373**	**9770**	**7688**	**68**	**79**
Total	**29302**	**27082**	**21955**	**75**	**81**

Analysis of Table 1 shows low reliability of water resources predictions, seriously complicating Naryn-SyrDarya water reservoirs' cascade operation planning as well as grounding potential water intake volumes that is those parameters which are approved by ICWC and amplified if necessary within considered period. With low water availability scales' clarification and forecast expectations incorrectness BWO "SyrDarya" proposed to reduce water intake limits in accordance with amplified water resources volume, however 26th ICWC meeting in Dushanbe (April 29, 2000) approved water intake limits for normal water year conditions leaving for BWO right to carry out correction according to forming water situation.

Water resources deficit in 2000 turned out to be more than in other low water years of last decade (1995 and 1997), when water volume in Chirchik and Karadarya river basins allowed in some cases to mitigate situation in SyrDarya basin itself (for example, transfer of

250 mln.m^3 from Charvak water reservoir in Chardara in summer 1995). This time there were no such opportunities, especially in Karadarya basin, where inflow value in Andijan water reservoir was one third of norm.

Naryn-SyrDarya water reservoirs cascade operation rules foresee in such cases that releases increase firstly from Kairakkum reservoir and only then if it is necessary - from Toktogul reservoir. Recent years abilities of these water reservoirs are used in above-mentioned direction only under interstate agreements conclusion, where required releases regimes and supply by downstream countries (Uzbekistan and Kazakhstan) of heat and power resources compensating fulfillment of such regimes. But experience shows that agreements are signed often behindhand as well as supply schedules are not kept - as for terms, so for volumes. All mentioned disadvantages do not promote achievement of expected result - water resources are irrevocably lost (releases in Arnasay and losses in SyrDarya lower reaches), water consumers do not receive required water volumes or receive it behindhand when water needs are already less or they are not available, ecological water basin state aggravates, sanitary releases along the river are not followed, in particular downstream Farkhad hydrounit, in Aral Sea and its coastal zone. If water users receive water volume approved by ICWC, its distribution would not be uniform within growing period - predominately in April, May and sometimes in September, in summer often less than 10 m^3/s comes to the sea. Therefore timeliness of agreements conclusion and their fulfillment necessity have big importance that recent vegetation proved.

On 14 November 2000 in Dushanbe interstate Agreement was signed between Tajikistan and Uzbekistan about cooperation in effective water-power resources use in 2000, which includes obligations of sides regarding required regime of Kairakkum reservoir operation - terms of its filling and releases regime in June-September, schedule of electric power intertransfers between sides with defining volumes and term of their fulfillment as well as other supplement measures and tariffs for delivered resources.

It was already clear In May that releases regime in March-April 2000 established by "Barki Tochyk" Kairakkum water reservoir would have not been filled (according to Agreement) by May 31, 2000. In result 600 mln.m^3 water were lost. They were extremely necessary in formed water situation.

Toktogul reservoir regime and measures on its realization were fixed in documents - intergovernmental protocol between Kyrgyzstan and Uzbekistan about water-power resources use of Naryn-SyrDarya water reservoir cascade in 2000 (March 16, 2000, Osh) and agreement among three basin states (Kyrgyzstan, Kazakhstan and Uzbekistan) signed on July 3, 2000 in Bishkek.

In the first document releases volume from Toktogul is limited by value 1.3 km^3 taking into account that the same amount would be released for needs of Kazakhstan after signing similar agreement with Kyrgyzstan. In the first half of vegetation this issue was not solved that is reflected on amounts of disposed water in comparison with approved limits, more so gap between predicted resources and their actual value increased in June, especially in July.

Practically recent yeas situation was repeated, negotiations were prolonged, and water resources deficit increased. Irrigated lands of SyrDarya middle reaches were found in especially difficult situation where as before limitation of release of Kairakkum reservoir vas valid because of Makhram pumping station. Obligations on problem solution were taken in all three annual agreements between Tajikistan and Uzbekistan, but realization faced impossibility to clean head race to pumping station. In the end of May 2000 during negotiations of governmental delegations from two states alternative was proposed: Uzbek side took obligation to fulfill required volumes of works on putting into operation "Makhram 0" pumping station for pumping water with water horizon lowering in Kairakkum reservoir to mark 3339.80 m (protocol from May30, 2000, Tashkent). However, for the first two summer months while these

works were carried out limitation of release existed and this was seriously reflected on releases volume and water availability of middle reaches irrigated lands.

Agreement among three basin states (Kyrgyzstan, Kazakhstan and Uzbekistan) signed in Bishkek on July 31, 2000 was controversial. In article 2 ordinary formula of recent years was repeated that Kazakhstan and Uzbekistan receive power in equal shares, however, it was underlined that states would receive to 1100 mln. kwh understood as opportunity to receive those power volume which would be acceptable for each side. But then specific releases' volume from Toktogul shouldn't be established for summer months, because it would be necessary to receive specific power volume generated by released from reservoir water passing through hydropower aggregates.

Since second decade of July Kazakhstan reached 6-9 mln. kWh power reception per day, appropriately release from Toktogul as well as water intakes in "Dostyk" canal increased. Nevertheless, water deficit in July was maintained because this month corresponded to lateral inflow minimum to river trunk, and Toktogul release volume 571 m^3/s was insufficient. Putting into operation "Makhram 0" pumping station allowed to release those 800 mln. m^3 that for some years were suspended in water reservoir. Releases from Kairakkum reservoir in August reached maximum and for the first time water intakes exceeded limits; pointed ratio was maintained in September.

Results of water supply of state-water users of SyrDarya basin are given in Table 2.

Table 2

ICWC state-members water intakes in growing period 2000

Republic, water-economic plot	ICWC limit, mln m^3	Actual, mln m^3	%
Kyrgyzstan	200	248.5	124.25
Uzbekistan	8800	8530.9	96.9
Tajikistan	1800	1922.4	106.8
Kazakhstan, ("Dostyk" canal)*	577,5	490.98	85.02

*"Dostyk" canal water intake limit was adopted according to Agreement from July 3, 2000.

General character of parameters given in Table 2 should be underlined; in irrigation water has special meaning supplied not only during whole period (in this case - during growing period), but in certain specific period of time. Therefore pointed parameters, which seem to be acceptable, require deciphering and more detailed analysis. At picture 1 monthly dynamics of water intakes from SyrDarya river trunk in zone of BWO "SyrDarya" activity in comparison with limits approved by ICWC is presented; clear presentation of present situation related to the most important measures taken for mitigating pressure of crisis moments. If in April and May actual water intakes were practically relevant to limits - under water resources availability in that time and low water intakes, deficit occurs in June-July, because despite of increase of power reception by Kazakhstan power system since second decade of July, its total volume was insufficient; besides, limitation of releases from Kairakkum aggravated situation. Only in early August releases from Kairakkum reached maximum for all growing period and for the first time in summer period actual water intakes exceeded limits and continued to increase till September. However, extra water intakes in August-September improving total seasonal parameters can't meet requirements for water under-delivered in summer peak period, because water needs can't be put away, and effect of returning water earlier under-received is not very high.

Water availability should be estimated over river sites - from Toktogul water reservoir to Uchkurgan hydrounit, from Uchkurgan to Kairakkum hydrounit, and from Kairakkum hydrounit to Chardara water reservoir. Let us carry out analysis only for summer months. Taking into account insignificance of volumes disposed by Kyrgyzstan as well as detailed consideration of water intakes dynamics for irrigated lands of Kazakhstan in BWO "SyrDarya" activity zone in materials on the third agenda issue of present ICWC meeting, let us consider data over Uzbekistan and Tajikistan - see Table 3.

Table 3

State-water user	June		July		August		Total		%%
	Limits, mln m^3	Actual, mln m^3	Limits	Actual	Limits	Actual	Limits	Actual	
Toktogul-Uchkurgan									
Uzbekistan	687,3	578,4	863,8	666,0	771,9	680,1	2323,0	1924,5	82,8
Tajikistan	43,9	35,2	45,3	36,1	43,5	39,7	132,7	111,0	83,6
Uchkurgan-Kairakkum:									
Uzbekistan	97,8	92,6	137,7	111,3	114,6	110,7	350,1	261,3	89,9
Tajikistan	93,4	132,6	95,3	136,5	72,6	121,8	261,3	390,9	149,6
Kairakkum-Chardara									
Uzbekistan	1126,8	857,5	1300,7	949,3	900,7	1050,6	3328,2	2857,4	85,8
Tajikistan	230,6	226,6	241,7	230,1	229,2	258,1	701,5	714,8	101,9

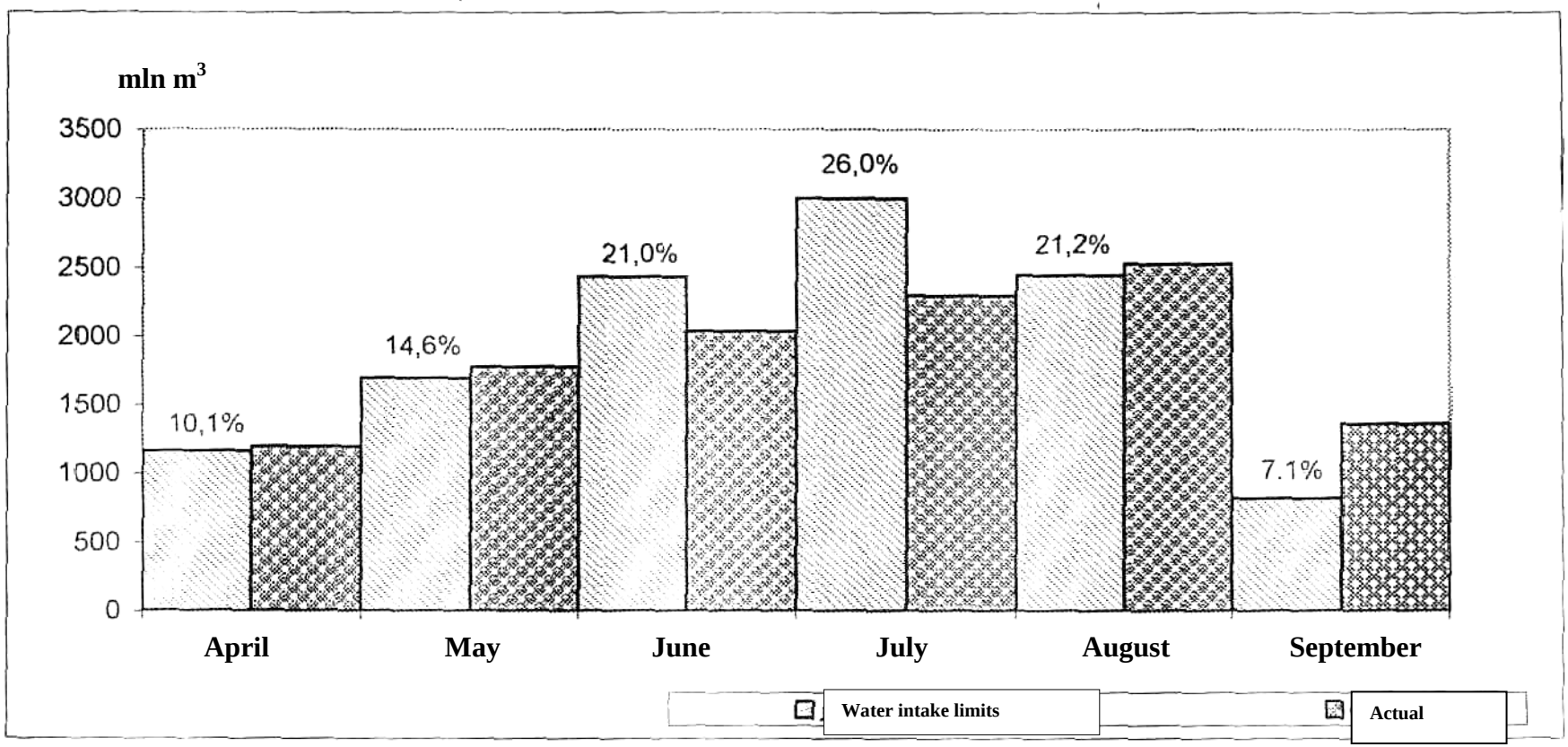


Fig. 1. Dynamics of actual water intakes from SyrDarya river in comparison with water intake limits in growing period 2000.

Thus, through all summer period irrigated lands of upper reach were in the strictest conditions that can be explained by absence of Agreement between Kazakhstan and Kyrgyzstan, hence, lack of releases from Toktogul water reservoir, and low water availability increase. In June-July the lowest water availability was downstream Kairakkum water reservoir, but situation was adjusted in August by increasing releases from water reservoir. Actual water intake predomination over limits within the second site for Tajikistan can be explained by predominating pumping stations water withdrawals. BWO doesn't carry out management of these water withdrawals, controlling them only. If agreements were concluded without delays, and Kairakkum water reservoir didn't lose 600 mln m^3 before growing period had started, mentioned disadvantages in water intakes fulfillment could have been avoided.

Restriction of SyrDarya water sector functioning conditions required reconstruction of Naryn-SyrDarya water reservoir cascade regime. Properties of water reservoirs cascade operation are presented in Tables 4 and 5.

Table 4

Parameters of Naryn-SyrDarya water reservoirs cascade operation in growing period 2000

Water reservoir	Water reservoir capacity, mln m^3			
	On 1.04.2000	On 1.10.2000		On 1.10.1999
		on ICWC schedule	Actual	Actual
Toktogul	10999	13351	13705	16272
Andijan	1376	150	305	1043
Charvak	694	420	503	1466
Kairakkum	3227	964	1002	2018
Chardara	5246	727	757	768
Total	21542	15612	16272	21567

Table 5

Water reservoir	Releases, mln m^3	
	on ICWC schedule	Actual
Toktogul	6342	6477
Andijan	2045	1931
Charvak	3688	3681
Kairakkum	6663	6780
Chardara	6737	6420
Total	25475	25289

Due to reception of 1635 mln kwh by Uzbekistan instead of 1100 mln kWh on agreement of July 3, 2000 (Kazakhstan has received 514 mln kwh) release quantity increased from Toktogul reservoir reaching 6477 mln m^3 that was reflected on water supplies in it - they were 13705 mln m^3 - this is by 2.5 km^3 less than on the same date last year. For the first time for recent years Kairakkum water reservoir was released. Chardara, Charvak, and Andijan reservoirs were released practically completely.

Regarding water inflow to Chardara reservoir according to agreement of July 3, 2000 approved by 27th ICWC meeting pointed parameter in growing period 2000 must have been 2773 mln m^3, and actually 2432 mln m^3 came to water reservoir (over river, fixed on gauge

Kokbulak+Keles) and according to other sources - 823 mln m^3, and in total 3255 mln m^3 that is 117 % planned volume. Besides, 971 mln m^3 came to Aral Sea and its coastal zone that could be recognized as acceptable result in present hard conditions; however, given volume mainly came in April-May and in September that is tense ecological-epidemiological situation downstream in summer peak retained as before.

In conclusion the most significant moments of recent vegetation and tasks which should be decided in nearest future to eliminate found defects should be noted:

1. Basin irrigated farming in growing period was found in difficult situation because of following reasons:
   - Hydrological forecasts low reliability because actual water resources turned to be much less than it was expected. Planned water resources served as a base of planning Naryn-SyrDarya water reservoirs cascade operation regime and water intake limits;
   - Kairakkum reservoir operation regime malfunction and loss of 600 mln m^3 for water users;
   - Behindhand conclusion of agreements on compensating fuel-power resources deliveries and operation regimes of Toktogul and Kairakkum water reservoirs as well as irregularity of their fulfillment resulted in water deficit in June and July, in particular - in SyrDarya middle reaches.
2. Power reception of 1635 mln kWh by power system of Uzbekistan under established in agreement 1100 kWh had important meaning. Situation became stable only in the second part of vegetation period due to above-mentioned fact as well as to:
   - Installation of "Makhram 0" pumping station which allowed to use of about 800 mln m^3 water of Kairakkum reservoir;
   - Power reception increase by Kazakhstan since second part of July 2000.
3. Works on increasing hydrological forecasts' reliability degree for water resources as well as on carrying out forecasts for water year in a whole and for several years should be continued.
4. It is necessary to accelerate annual agreements signing, therefore they must be formulated before or in the very beginning of the year, not in vegetation period peak; documents must be prepared carefully, all possible consequences from obligations' fulfillment by sides must be think through. Execution discipline must be strengthened.

Actual Naryn-SyrDarya water reservoirs cascade operation regime for last vegetation period is given in Table 6.

Table 6

Schedule
of Naryn-SyrDarya water reservoirs cascade operation regime
for period since April 1, 2000 till September 30, 2000

	Measure-ment unit	April actual	May actual	June actual	July actual	August actual	September actual	Total mln m^3
Toktogul reservoir								
Inflow in water reservoir	m^3/s	288	733	780	732	540	355	
	mln m^3	746	1963	2022	1961	1446	920	9059
Volume: Beginning of period	mln m^3	10999	10874	12202	13051	13377	13421	
End of period	mln m^3	10874	12202	13051	13377	13421	13705	-
Release from water reservoir	m^3/s	331	352	451	571	513	233	
	mln m^3	858	943	1169	1529	1374	604	6477
Kairakkum reservoir								
Inflow in water reservoir	m^3/s	424	326	309	317	331	248	
	mln m^3	1099	873	801	849	887	643	5152
Volume: Beginning of period	mln m^3	3227	2957	2761	2421	1875	1139	
End of period	mln m^3	2957	2761	2421	1875	1139	1002	-
Release from water reservoir	m^3/s	547	329	378	456	562	299	
	mln m^3	1418	881	980	1221	505	775	6780
Inflow in water reservoir	m^3/s	622	130	166	103	82	143	
	mln m^3	1610	349	430	275	220	371	3255
Volume: Beginning of period	mln m^3	5246	5146	3663	2605	1206	627	
End of period	mln m^3	5146	3663	2605	1206	627	757	-
Release from water reservoir	m^3/s	599	593	478	498	203	63	
	mln m^3	1553	1588	1239	1334	543	163	6420
Release in Kzylkum canal	m^3/s	22	41	43	67	39	13	
	mln m^3	57	110	111	179	104	34	596
Supply in Aral Sea	m^3/s	190	113	21	9	11	26	
	mln m^3	492	303	54	24	29	67	971
Charvak reservoir								
Inflow in water reservoir (3 rivers amount)	m^3/s	198	413	321	230	166	119	
	mln m^3	513	1106	832	616	445	308	3821
Volume: Beginning of period	mln m^3	694	807	1277	1239	895	551	
End of period	mln m^3	807	1277	1239	895	551	503	-
Release from water reservoir	m^3/s	146	214	309	326	276	122	
	mln m^3	378	573	801	873	739	316	3681
Andijan reservoir								
Inflow in water reservoir	m^3/s	53	76	90	69	50	45	
	mln m^3	137	204	233	185	134	117	1010
Volume: Beginning of period	mln m^3	1376	1272	1112	888	494	323	
End of period	mln m^3	1272	1112	888	494	323	305	-
Release from water reservoir	m^3/s	90	135	149	199	113	44	
	mln m^3	233	362	386	533	303	114	1931

REVIEW OF BWO ''SYRDARYA'' ACTIVITY IN GROWING PERIOD 2000

(Information on the third issue of ICWC meeting agenda)

On 27th ICWC meeting in Fergana as ICWC member from Kazakhstan proposed for 28th ICWC meeting agenda question "Review of BWO "SyrDarya" activity in growing period 2000" should be included. BWO "SyrDarya" objective is carrying out water supply on Kazakhstan part of "Dostyk" canal and approved by ICWC inflow volume to Chardara reservoir in growing period, therefore necessity arose to estimate fulfillment of established parameters in details. Critical situation in irrigated farming of Kazakhstan impelled water management leadership of the republic to put question of BWO activity responsible for water diversions along SyrDarya trunk, their distribution and Naryn-SyrDarya water reservoirs cascade operation regime.

Water diversion share of each SyrDarya river basin state is grounded in project materials ("Amplified scheme of SyrDarya river basin water resources integrated use and conservation. Correcting note."), which can be supplied under appropriate parameters of Naryn-SyrDarya water reservoirs cascade operation. Causes according to which these parameters changed after 1991 are widely known; they are related to change of political-economic situation in central Asia, formation of five independent states presently making attempts of transiting to world market economy and introducing new economical methods. Changes were not very successful that could be explained by interruption of well-adjusted relations existing in single state - Soviet Union.

One of similar change results touched water management of SyrDarya river basin because conflict between downstream and upstream countries (or, otherwise, between hydropower and irrigated farming) increased, and their different interests existing as inter-departmental contradictions now gradually turn to interstate ones. In result Naryn-SyrDarya water reservoirs cascade operation regime turned out to be completely reconstructed. Attempts to regenerate (since 1995) mechanism of integrating all these interests that means providing compensating deliveries of heat and power resources for suspended water for irrigation needs in cascade water reservoirs (Toktogul and Kairakkum) are non-successful.

There is no alternative to this mechanism. Therefore it is important to find way out from deadly embrace aggravating repeatedly in dry growing period. Low water period was more significant than it was expected according to hydrological forecasts that proved restriction of initial conditions of SyrDarya water sector functioning.

ICWC approved changed cascade operation parameters on its meeting in Fergana that was adopted originally in Dushanbe. But approved parameters could be realized successfully only if they are provided with intergovernmental agreements between Kyrgyzstan, on one hand, and Kazakhstan and Uzbekistan, on the other hand, (on Toktogul reservoir regime) as well as between Tajikistan and Uzbekistan (on Kairakkum reservoir regime). Agreement between Tajikistan and Uzbekistan was signed timely (January 14, 2000) and not fulfilled completely, because by May 31, 2000 Kairakkum reservoir hasn't been filled as foreseen by Agreement - in result 600 mln m^3 was lost for irrigation of SyrDarya middle reaches lands. As for Toktogul reservoir regime forecasts incorrectness of expected water resources aggravated situation, because it was already clear in April-May that low water availability would be more significant than it was expected according to initial forecasts of Glavgydromet. Therefore negotiations had to be proceeded during growing period. Firstly "Intergovernmental protocol between Government of the Kyrgyz Republic and Government of Uzbekistan about Naryn-SyrDarya water reservoirs cascade water-power resources use in 2000" was signed (March 16 in Osh) where volume of required increase of releases from Toktogul reservoir in starting growing period was limited to 1.3 km^3 over own consumption by Kyrgyzstan compensated with power reception, deliveries of natural gas and fuel oil on HEC of Bishkek and Osh. Uzbekistan must have adopted 580 mln kWh Kyrgyz power in summer period. In that time Kazakhstan hasn't decided yet what

position it should take and was holding negotiations with Kyrgyzstan. According to frame agreement among all SyrDarya basin states about basin waterpower resources use from March 17, 1998 Kazakhstan up to signing annual Agreement in summer period has been receiving power in small amounts from Kyrgyzstan - reception volume didn't exceed 2-5 mln kwh/day. It is important to remember main principle of frame agreement from March 17, 1998 - volume of Toktogul reservoir water resources released over own demand of Kyrgyzstan is directly proportional to received power quantity. This principle was put in basis of formed situation analysis in recent growing period.

There is one difficulty under organization of water supply in Kazakhstan part of "Dostyk" canal. Water supply as well as water intake regime is formed in correspondence with water consumption regime for those soil-reclamation area, which areas irrigated by this canal belong to. Common in Central Asia water consumption regimes zoning developed by "Sredazgiprovodkhlopok" Institute ("Accounting values of irrigation norms of agricultural standards in SyrDarya and AmuDarya river basins") foresees in accordance with physiological requirements of agricultural crops for "Dostyk" canal zone (in %% total water intake volume) certain water distribution over months of growing period (see Fig. 1). This ratio was kept in claim of Kazakhstan for 1991 (Pic.1). But recent years proportion of claimed monthly shares of water for lands irrigated by "Dostyk" canal was significantly broken: in present growing period according to claim of water bodies of Kazakhstan in summer months almost 90% all required volume (more exactly 88 %, see Fig. 1) must have been disposed. Such distortion can't be related to design regime of canal operation meant for certain loads that creates additional troubles in its operation organization and its water supply, which availability can't be combined with such uneven demands.

Serious reason of actual water intakes' deviation from established volumes' is quantity of received power generated by Naryn hydropower units cascade; established parameters and other indicators of SyrDarya water sector work in current vegetation period are given in intergovernmental agreement signed in second part of vegetation period - on July 3, 2000 in Bishkek. Principle of power reception parity by Uzbekistan and Kazakhstan, which was kept in all previous agreements since 1995, is approved here, but simultaneously in Article 2 it is said that every republic receives "up to 1100 mln kwh". Reason of such approach is clear and caused by ignorance of water resources quantity that could be expected in reality that is explained by hydrological forecasts low reliability: it is enough to give example of high water growing period 1998 when actual water resources quantity allowed to avoid additional releases form Toktogul under appropriate violence of annual agreement based on forecast expectations. But in last agreement Article 2 of document text is contradictory with Article 1 where specific volumes released from Toktogul are established. Article 2 established only equal share in power reception between Uzbekistan and Kazakhstan and permissible level of reception - 1100 mln kwh. Total power quantity from Kyrgyzstan was adopted on agreement, however its distribution between recipients turned out to be other one - three fourth was received by Uzbekistan and one fourth - by Kazakhstan. Parity principle was violated. And there are no equal shares of water volumes for both state-consumers.

Uncertainty put in agreement from July 3 gave freedom in power reception ("receive as much as one can") and as a result appropriate regime of Toktogul releases. Kazakhstan power system received in June on average within 3-5 mln kWh/day, in second decade of July this indicator increased to 6-9 mln kWh and stayed at the same level in August 2000. Appropriately releases from Toktogul and water diversions in "Dostyk" canal increased.

It is expedient to involve in analysis data on water intakes regime for all state-water users and water reservoirs cascade operation within the rive site "Kairakkum-Chardara". In agreement water supply regime was changed in Kazakhstan part of "Dostyk" canal in summer months 2000 and inflow regime was amplified to Chardara water reservoir in the same terms. Therefore now actual parameters of last vegetation period should be compared with parameters approved by ICWC and corrected intergovernmental agreement from July 3, 2000 (for summer months of

completed vegetation period). Similar change of discharges on "Dostyk" canal rather corresponds to water intake regime developed by "Sredazgiprovodkhlopok" (see Fig. 1).

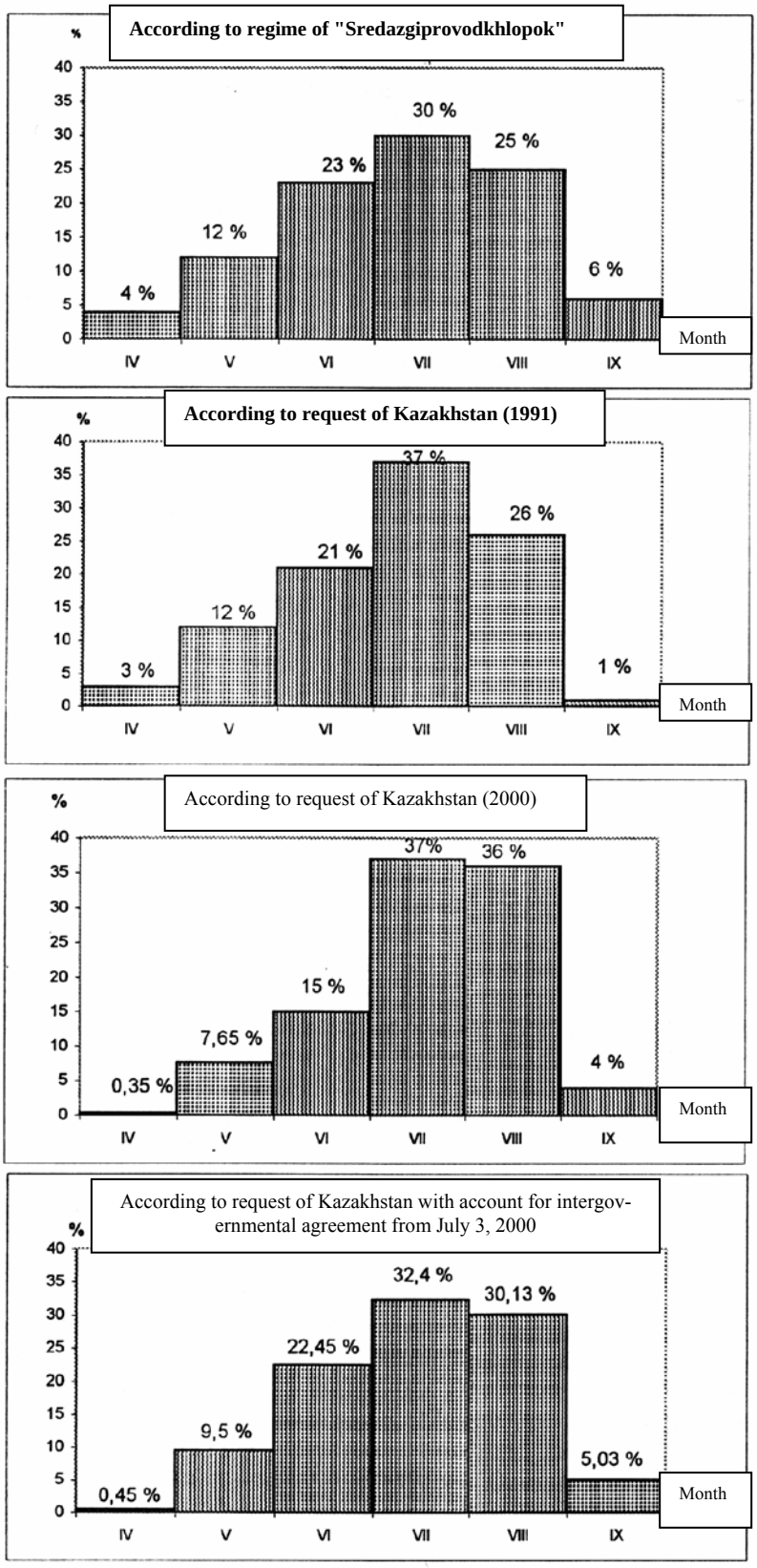


Fig. 1. Irrigation norm distribution (%) for "Dostyk" canal zone in growing period

Total power quantities received by downstream republics were: Uzbekistan - 1635 mln kWh or 148.6 % volume foreseen by agreement form July 3; Kazakhstan - 514.5 mln kWh or 46.8 %. Parameters of water intake limits fulfillment over basin of every state-water users comparing to established power quantity are presented in Table 1. Fulfillment of approved parameters and obligations taken by sides in agreement not only corresponds to received power quantity but exceeds appropriate values. Water intake volume on "Dostyk" canal according to agreement for three summer months must have been 491 mln m^3 including received power - about 226 mln m^3, actually - 421 mln m^3. In total for vegetation period these parameters were appropriately - 577.312 and 491 mln m^3.

It is important to compare parameters of water intakes over state-water users within considered reach "Kairakkum-Chardara". On Fig. 2 monthly dynamics of water intakes is shown separately for each state. Actual water intakes of Uzbekistan and Kazakhstan in June and July are less than water intake limits. For Kazakhstan this difference is especially big in June and is reduced in July in relation to increasing received power quantity; in June critical situation occurs in "Dostyk" canal zone. Besides, in the same summer months one more restraining factor existed for all water users of reach - limitations of Kairakkum reservoir release because of Makhram pumping station. Issue was decided in early August 2000 after that water availability of SyrDarya middle stream lands increased: figure 2 shows that actual water intakes on this reach (both for Uzbekistan and Kazakhstan) in August exceeded planned parameters, the same situation was found in September. Similar trends in ratios between planned and actual water intakes remain also for Tajikistan, but they are not so obvious - probably, because within the reach machinery irrigation prevailed based on pumping stations water diversions from Kairakkum reservoir surface.

As for water inflow in Chardara reservoir according to schedule approved by ICWC 27th meeting total inflow in growing period 2000 should have been 2773 mln m^3, actual inflow- 2432 mln m^3 (along the river, measured on gauge Kokbulak-Keles) and on other inflow sources - 823 mln m^3 that is more than planned volume. For summer period 2000 agreement from July 3, 2000 foresees inflow in Chardara reservoir about 800 mln m^3, actually - 601 mln m^3 along the river (gauge Kokbulak-Keles) and 324 mln m^3 on other inflow sources, in total - 925 mln m^3. Thus, conclusion can be made that foreseen by ICWC decisions and amplified by intergovernmental agreement from July 3, 2000 parameters for growing period 2000 related to Kazakhstan - water intakes in Kazakhstan part of "Dostyk" canal and water inflow in Chardara reservoir have been fulfilled.

Table 1

Realization of water intakes from SyrDarya channel by basin state-water users in growing period 2000 and some other planned parameters in comparison with received power quantity from Kyrgyzstan

State-water user	Water intake, mln m^3			Power reception, mln kwh		
	Limit, parameter	Actual	%	Plan	Actual	%
Kyrgyzstan	200	248,6	124,3			
Tajikistan	1800	1923,1	106,8			
Uzbekistan	8800	8534,7	97,0	1100	1635	149,0
Kazakhstan ("Dostyk" canal)	577,5	491,0	85,0	1100	514,5	46,8
Total	11377,5	11196,3	98,4	2200	2149,5	97,7
Water inflow in Chardara reservoir	2771	3255				
Including gauge Kokbulak+Keles		2432				
Releases from Toktogul	6342	6477	103,4			

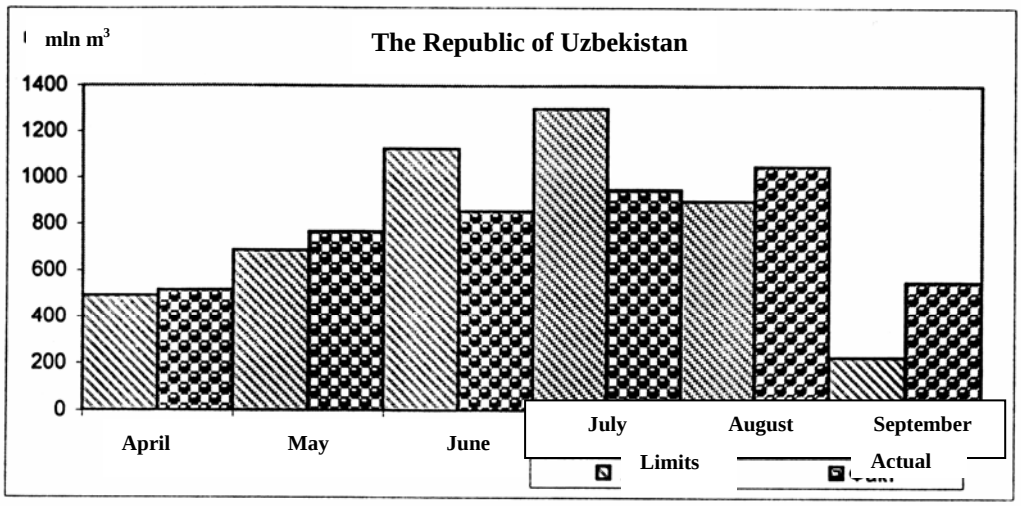
*According to agreement from 3 of July 2000.

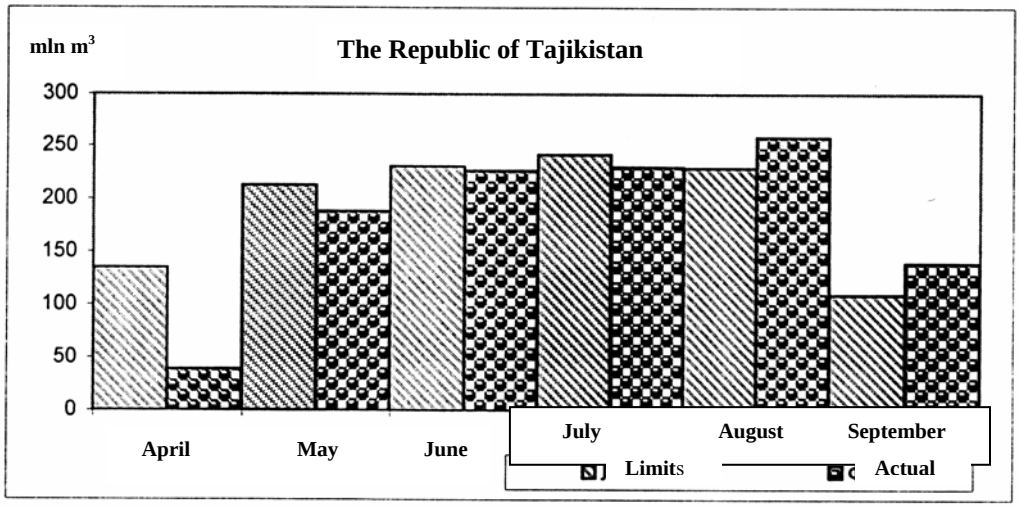
In spite of increasing obstacles in process of SyrDarya basin water sector functioning BWO "SyrDarya" is responsible as before for water resources allocation, however two principles should be emphasized that are determining recent years and keeping in process of implementing ICWC decisions and intergovernmental agreements:

- Regime of releases from Toktogul reservoir is closely connected with power quantity received by Kazakhstan and Uzbekistan from Kyrgyzstan;
- BWO "SyrDarya" allocates only available water resources;

In further to maintain regime of optimal water reservoirs cascade operation and supply of all water users with water resources in accordance with water intake limits following most important provisions should be fulfilled exactly:

- Intergovernmental agreements should be concluded before starting reporting period and take into account real opportunities of the states to fulfill obligations foreseen by these negotiation documents;
- It is important to keep obligations fulfilling within terms agreed in these documents, because water should be supplied timely according to irrigated crops requirements;
- If according to agreements and approved regime parameters water resources are delivered by transit through areas of third countries, latter wouldn't have right to suspend water bringing damage to other state-water users.





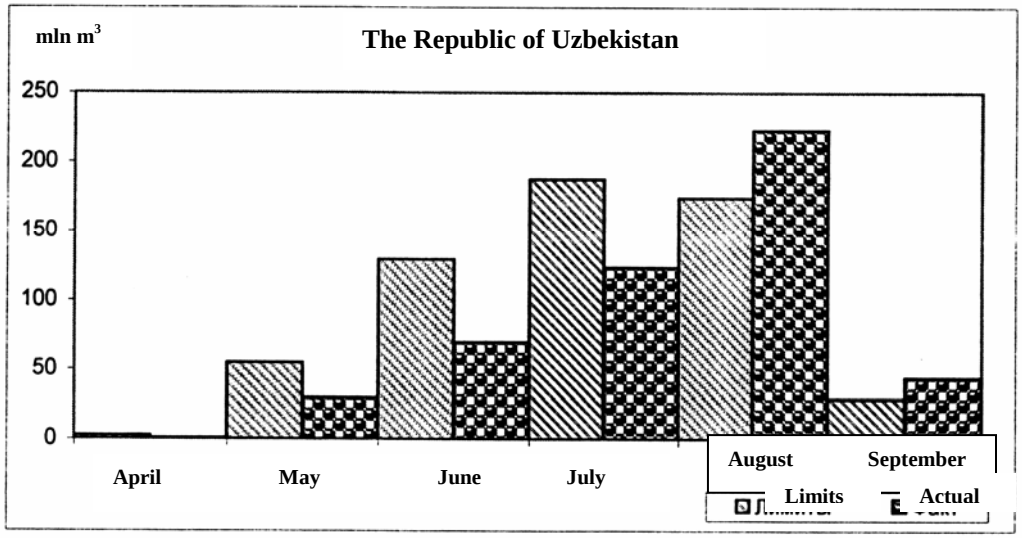


Fig. 2. Water intakes within SyrDarya reach from Kairakkum to Chardara water reservoir.

ANALYSIS OF LOW WATER PERIO 2000 AND MEASURES FOR 2001 OVER SYRDARYA RIVER BASIN

(Materials were prepared by BWO "AmuDarya")

1. Water situation analysis in non-growing period 2000

To carry out full analysis of low water period 2000, to make objective assessment it is necessary to remember how water situation formed in AmuDarya river basin on the eve of low water situation 2000, in growing period 1999-2000 underlining following typical characteristics:

1. Water availability in Kerky gauge upstream Garagumdarya including municipal discharges of Vakhsh river was 107.8 % norm. Actual was 15 595 mln m^3 under norm 14 468 mln m^3.

2. Actual water flow in Kerky gauge upstream Garagumdarya for non-growing period 1999-2000 was 20 426 mln m^3 or by 730 mln m^3 more than for last year non-growing period.

3. Water supply plan for the Aral Sea and its coastal zone for non-growing period was fulfilled on 209.5% under plan 2000 mln m^3 - 4191 mln m^3 was supplied, for appropriate last year period 4 066 mln m^3 was supplied, from them river flow constituted 3 073 mln m^3.

4. Adjusted water intake limits over basin were used on 96.4 % including Tajikistan - on 69.7 %, Turkmenistan - on 101.5 %, Uzbekistan - on 102.9 % (the republic used reserve in amount - 788 mln m^3).

5. Sanitary-ecological releases established for downstream water users were used in amount 773.8 mln m^3 under limit 800.0 mln m^3.

Conclusions

1. Favorable water-economic conditions of non-growing period in the AmuDarya river basin allowed basin states to carry out leaching and recharge gifts.

2. In the same time taking into account set of reasons optimal supplies of water resources couldn't be created in basin water reservoirs.

Actually available water-resources opportunities on creating maximum optimal water supplies in basin reservoirs were not used:

a) Because by the beginning of growing period 2000 water volumes on Nurek reservoir were 5773 mln m^3 under plan 5964 mln m^3. Shortage on Nurek reservoir was 191 mln m^3.

b) In spite of restraining measures undertaken by Minselvodkhoz of Uzbekistan and BWO "AmuDarya" in March 2000, which are directed on maintenance of water volumes in Tuyamuyun reservoir at level at least 4000 mln m^3 because of low actual inflow in March water volumes in Tuyamuyun reservoir on 01.04.2000 were 3611 mln m^3. Last year the same time 4452 mln m^3 was accumulated in Tuyamuyun reservoir. In result shartage was 841 mln m^3.

c) Over main AmuDarya river basin in-system reservoirs total water volume was 3395 mln m^3 or shortage comparing to last year on the beginning of growing period was 457 mln m^3.

d) Such situation with optimal water supplies accumulation in basin reservoirs was formed mainly on following reason. Enough satisfying water availability of recent years "lulled" water users of region. River basin states having sufficient experience of carrying out agricultural production in low water conditions, which have being observed for last 20-25 years, couldn't estimate degree of forthcoming low water period danger in advance, timely take appropriate preventive measures not foreseeing any negative results in future growing period.

3. Actual water resources stock in basin reservoirs by the beginning of growing period and preliminary water availability forecast for growing period that on average was within 99.7 % didn't become reason of special alarm in region.

2. Analysis of forecasts reliability

Basic kinds of forecasts, which presently are issued on rivers and used under planning regimes for vegetation period are: preliminary (March 10), amplified (April 10), quarterly and monthly forecasts. Main points are:

1. Vakhsh - inflow in Nurek reservoir (is made by Hydromet services of Tajikistan and Kyrgyzstan);

2. AmuDarya river - in gauge upstream water intake in Kairakkum canal under release of municipal water discharges through Nurek reservoir dam (is made by Hydromet service of Uzbekistan).

Analysis of AmuDarya river water availability forecasts reliability carried out in 1989-2000 for growing and non-growing periods (gauge upstream water intake in Kairakkum canal) shows that growing period forecasts are reliable in 6 cases from 10 (60 %); forecasts reliability for non-growing period is only 10 %.

Years (October-March)	Non-growing period		Growing period	
	forecast	actual	forecast	actual
1989-1990	770-930	860	2850-3350	2920
1990-1991	820-980	985	2500-3100	2570
1991-1992	880-980	1065	3000-3600	4020
1992-1993	900-1000	1435	2800-3400	2940
1993-1994	900-1000	1340	3400-4000	3580
1994-1995	1000-1100	1230	2600-3000	2440
1995-1996	850-950	1025	2400-2800	2835
1996-1997	900-1000	1285	2600-3000	2255
1997-1998	800-950	1035	3000-3400	3960
1998-1999	900-1100	1255	2700-3100	3080
1999-2000	900-1000	1010	2600-3000	2160
2000-2001	800-900	-	-	-

Let us carry out analysis of reliability of forecasts 2000 and their impact on preventive measures' implementation.

1. According to preliminary water availability forecast for growing period given on March 10, 2000 by Uzglavgydromet water availability in Kerky gauge upstream Garakum canal was expected within 44.3-50.6 km^3 (93.0-106.3 %) or on average 99.7 % under norm 47.6 km^3.

2. According to amplified water availability forecast for growing period given in a month, April 10, 2000 water availability in above-mentioned gauge was expected within more decreased limits 41.1-47.4 km^3 (86.4-99.7 %) or on average 93.0 % norm.

3. Actual water availability for reporting growing period in given Kerky gauge upstream Garakum canal was 34.1 km^3 or 71.6 % norm. Actual deviation from border values of preliminary forecast was 93.0 - 71.6 = 21.4 %, 106.3 -71.6 = 34.7 % main forecast 14.8-28.1 %.

4. Quarterly forecasts reliability of growing period looks in such a way:

Actual water availability of 2^{nd} quarter was 16.64 km^3 or 78.4 % norm. According to forecast water availability was expected within 88.9 - 103.7 %, deviation from border values was 10.5 - 25.3 %.

Actual water availability of 3rd quarter was 16.7 km^3 or 63.5% norm. According to forecast water availability was expected within 75.5 - 87.6% norm, deviation was 12.0 - 24.1%.

Thus given forecasts of water availability for growing period 2000 for 2nd and 3rd quarters of current year have not been reliable. In spite of attempts of Uzglavgydromet during vegetation period timely to bring appropriate amendments and amplifications under predicting monthly forecasts of water availability, however, from 6 monthly forecasts 2 ones were not reliable, but on own values they are the most peak months of growing period - June and July. Under water availability forecast in June 3000-3400 m^3/s actual was 2380 m^3/s or deviation was 620-1020 m^3/s. Under water availability forecast in July 3200-3700 m^3/s actual was 2670 m^3/s or deviation was 530-1030 m^3/s. Generalizing monthly forecasts of growing period we obtain following variant of water availability forecast for period with water availability limits 71.6-85.5 %. Comparing to actual (71.6 %) it is obvious that actual coincides with minimal value of limit. It means that Uzglavgydromet practically exceeded forecasts' values during all vegetation period.

Thus, forecasts' reliability is non-satisfied. Role and importance of forecasts is very high because correctness of following processes depends on them:

- adoption of basin water reservoirs operation and water intake regimes' option;
- water intake limits establishment for the states;
- water policy strategy development in the region;
- decision-making process and other factors adoption related to agricultural production.

Exceeded water availability forecast for growing period 2000 was reflected negatively on correctness of decisions made by the states in issues of water and agricultural policy in region.

Actual water availability in Kerky gauge upstream Garakum canal for reporting growing period was 34.1 km^3 under norm 47.6 km^3 that is 71.6 %.

Actual water flow in this gauge was record low value 28.3 km^3 regarding recent decades (normal water flow is about 42.0 km^3). In 1997 low water year actual flow in Kerky gauge upstream Garagumdarya was 35.7 km^3, in 1995 it was 38.6 km^3. Similar hard low water situation in growing period in AmuDarya river basin hasn't been observing many years.

Practically for the first time in recent decade by the beginning of growing period (2000-2001) necessary planned water resources supply in Nurek reservoir couldn't be created in amount 10 bln 540 mln m^3, actually on 01.10.2000 water amount in Nurek reservoir was 10 bln 90 mln m^3 or deviation from accumulation schedule was permitted in amount 450 mln m^3.

Till 01.06.2000 effective volumes of Tuyamuyun reservoir have been completely released. For more than 4 months water resources allocation downstream is completely fulfilled in percent depending on inflow in Tuyamuyun reservoir. On 01.10.2000 water volumes in Tuyamuyun reservoir were 1820 mln m^3 or water reservoir dead volume release was permitted on 380 mln m^3. Last year by this date 3684 mln m^3 were accumulated.

By 01.10.2000 over in-system water reservoirs 2050 mln m^3 were accumulated. Shortage in comparison with last year was 400 mln m^3.

3. Water supply in growing period 2000

Actual available water resources over basin in Kerky gauge upstream Garakum canal according to growing period results were 38765 mln m^3 and consist of following points:

- 28501 mln m^3 - actual flow in Kerky gauge;
- 1315 mln m^3 - water intakes of Surkhandarya oblast;
- 4366 mln m^3 - accumulation in Nurek reservoir;
- return waters - 1442 mln m^3;
- release of Tuyamuyun hydrounit - 1791 mln m^3;
- release of in-system water reservoirs - 1350 mln m^3.

Available water resources to Kerky gauge upstream Garakum canal were use in following way:

- 4366 mln m^3 were stored in Nurek reservoir;
- 1315 mln m^3 were diverted by pumps of Surkhandarya oblast;
- water intakes of Turkmenistan from river channel - 10629 mln m^3;
- water intakes of Uzbekistan from river channel - 9731 mln m^3;
- water intakes from in-system reservoirs - 1350 mln m^3;
- river release in Aral Sea coastal zone - 220 mln m^3;
- river losses on reach of Kelif gauge - Samanbay gauge - 11154 mln m^3;
- Total - 38765 mln m^3.

For vegetation period 2000 water deficit (established water intake limit exceeding over actual use) in AmuDarya river basin was 11.1 km^3 or about 30% limit. Over states deficit was distributed in following way:

State	Deficit, km	Deficit in % limit
Tajikistan	0,7	11
Turkmenistan	4,6	30
Uzbekistan	5,8	37
In total over basin	11,1	30

Such allocation is mainly defined by territorial unevenness:

River reach	Deficit, km^3	Deficit in % limit
Upstream	0,7	11
Middle stream	2,7	17
Downstream	7,7	52
In total over basin	11,1	30

Territorial unevenness is obvious also at national level:

Republic, site	Deficit, km^3	Deficit in % limit
Turkmenistan		
- Middle stream	1.8	17
- Downstream	2.8	55
- In total over republic	4.6	30
Uzbekistan		
- middle stream	0.8	15
- Khorezm	1.2	36
- Karakalpakstan	3.8	59
In total over republic	5.8	37

These data show that AmuDarya river lower reaches turned out to be in the most difficult situation in growing period 2000.

Water supply evenness over months on river reaches is following in % to established limits:

Item	April	May	June	July	August	Sept.	Total
Tajikistan	99,5	97,4	75,6	76,4	80,1	89,8	84,2
Uzbekistan incl.	106,6	66,5	68,3	50,9	48,8	94,5	63,8
- middle stream	88,1	114,9	89,2	76,6	76,2	97,5	88,1
-downstream	136,8	45,2	58,2	38,8	34,5	90,8	50,0
Turkmenistan incl.	91,0	84,2	72,8	58,8	54,7	57,1	68,6
- middle stream	95,0	97,9	87,7	72,4	70,1	56	80
- downstream	79,2	51,6	45,6	35,5	30,8	60,8	45,4
In total over basin	96,9	77,8	69,,4	59,3	58,0	63,3	71,1
- upstream	99,5	97,4	75,6	76,4	80,1	89,8	84,2
- middle stream	92,9	103,3	88,2	74,0	72,3	68,8	82,8
- downstream incl.	104,8	47,0	54,1	37,8	33,2	76,3	48,4
1. Khorezm	121,5	51,5	50,9	62,3	64,4	89,6	64,2
2. Karakalpakstan	164,7	42,1	62,8	29,5	22,9	92,0	42,6
3. Dashoguz obl.	79,2	51,6	45,6	35,5	30,8	60,8	45,4
Besides:							
Surkhandarya obl.	166,1	258,1	126,4	98,3	92,5	164,8	131,6

Carrying out analysis of supply evenness over months on river reaches shows that degree of low water period seriousness increases from upstream to downstream.

States of region jointly with BWO "AmuDarya" during growing period took measures on adjusting water discipline, strengthening of river water intakes control including pumping stations. Special control groups were created for this purpose. In the river middle reaches water intakes were reduced to run water to Tuyamuyun hydrounit. The same measures were carried out downstream to run water to Takhiatash hydrounit. Such measures gave certain effect on water use in region.

During hydrological 1999-2000 year 4885 mln m^3 was supplied to Aral Sea and its coastal zone under plane 5000 mln m^3, established water supply plan for non-growing period was fulfilled on non-growing period 209.5% under plan 2000 mln m^3 4191 mln m^3 was supplied, and established water supply plan for Aral Sea and its coastal zone for growing period was fulfilled on 20.5% under established plan 3000 mln m^3 614.0 mln m^3 was supplied. This is the lowest parameter for recent decade. Situation in Aral Sea coastal zone can be considered as disastrous.

4. Uncertainty factors in river flow management

Factors of uncertainty and dynamics influence basin water resources management: natural flow irregularity, low level of available resources antropogenous component formation prediction (return flow) and flow transformation processes along the channel and in reservoirs (losses, filtration flows, coastal regulation). Human factor is also very important which activity is based on information available and predictability of actions.

As it was mentioned before, actual water availability at site upstream Karakum canal's water intake in the growing season 2000 was 34.1cu.km (2160 cu.m/s). This value is outside of predicted range:

Forecast	**Cu.km**	**Cu.m/s**
Preliminary	44.3-50.6	2800-3200
Amplified	41.1-47-4	2600-3000

Reliability of quarterly (2-nd, 3-rd quarters) and monthly forecast for growing period 2000 is found low. Actual water availability for June-July was 2530cu.m/s that is lower than monthly forecast on 800cu.m/s.

In-year forecast irregularity imposed on territorial irregularity of water intake led to maximum deficit in river lower reaches in June-July. Downstream only 4200mln.cu.m were released against planned 5410mln.cu.m.

Under low flow reliability other factors meaning will increase. Especially important are the methods use for calculation of inflow to Tuyamuyun and losses downstream this reservoir.

Analyzing actual situation along the river during vegetation 2000, the following balance can be presented (cu.km):

AmuDarya water availability-34.2
- Nyrek reservoir filling-4.4
- Upstream water intake-1.3

River flow upstream Karakum canal-28.4
+ Return waters-1.4
+ Water release from reservoir-1.8

Available resourcedownstream Tuyamuyun reservoir-31.7
- Middle and lower reaches water intake-20.4
- Release to the Aral Sea-0.2

Total: balance discrepancy-11.1.

This discrepancy is distributed along the river as follow: (1) upstream reservoir-2cu.km, (2) reservoir-3.2cu.km, (3) downstream reservoir-5.9cu.km. Losses assessment done by SIC ICWC for dry years (1982, 1989, 2000) shows, that losses during vegetation period are as much as 6-8cu.km including: (1) upstream reservoir 2.5-3.0cu.km, (2) reservoir 0.5-0.7cu.km, (3) downstream reservoir 3-4cu.km.

If to take upper limit of this assessment and compare it with discrepancy of 2000 (11cu.km), 4-6cu.km will be unaccounted losses. Especially difficult is discrepancy interpretation at the reservoir. Non-proportional to losses distribution of discrepancy along the river can be explained by low reliability of flow account on gauging stations. Management effectiveness depends on reliability of "residual" inflow to hydrounit (Darganata site), objective assessment of channel losses, speed of correcting calculations taking into account water-economic conditions changes compared with plan.

In AmuDarya basin under existing regime of Nurek reservoir operation in annual energetic regime (when reservoir is filled up during growing season and empted out during non-growing period) downstream compensation irrigation regulation is needed. Partial flow redistribution for irrigation needs is made by in-system reservoirs, but main load is on Tuyamuyun reservoir which is last in Vakhsh-AmuDarya cascade.

Major disadvantage of such regulation is multiyear calculations absence which could give rational restrictions for reservoirs filling at the end of the year. Analysis of reservoir operation during October 1999-September 2000 shows that flow management during non-growing season (October 1999-March 2000) was not much effective if plan would be prepared for all year round.

Non-growing period's opportunities were not used optimally and necessary water storage in reservoirs at the beginning of growing period was not accumulated. Deficit in Nurek reservoir compared to plan was 0.2cu.km, in in-system reservoirs it was 0.5cu.km, over diversion constituted 1.2cu.km and release to the Aral Sea over limit was 1.6cu.km.

Totally unused resources for growing season are evaluated as 3.5cu.km and, taking into consideration technical constrains of accumulation, 2.5-3.0cu.km.

To the end of growing season 2000 water storage was 14cu.km, including Nurek (10.1cu.km), Tuyamuyun (1.8cu.km), in-system reservoirs (2.1cu.km). In this connection main task of this growing season is reservoirs filling up.

5.Conclusions and proposals

Low reliability of forecast and assessment of available water resources, lack of information about actual river flow and current water deficit in the basin are main destabilizing factors which created uncontrolled situation and water diversion over limits in the growing season of dry 2000. These actions were reason for uneven water distribution among water consumers and catastrophic consequences for downstream.

Main reason for uneven deficit distribution in time, in our opinion, is ineffective flow regulation by water reservoirs. Regulation should be considered as a mean of available water resources increase. Regulation should be executed through regulating functions distribution between Nurek, Tuyamuyun and in-system reservoirs. Multiyear calculations should be teken into account as well.

Analysis of non-growing period of 1999-2000 shows that it was possibility to accumulate 2.5-3.0cu.km water more than planned under rational reservoirs management. Nurek reservoir use as a multiyear regulation reservoir would allow to release during growing period additionally 0.5-1.0 cu.km without damage to next years.

Thus, deficit of 2000 could be reduced on 3-4cu.km and reach 7-8cu.km. Under even distribution among consumers it would be 20 % of established limit (for example, for Karakalpakstan actual deficit is about 60 %).

Achieved positive results in water resources management and allocation at interstate level permit to regulate interrelations between the states in common water resources use and management through BWO-ICWC executive body.

As experience shows, in cases of water deficit that occurred in 2000 more flexible and agreed system of available water resources distribution is required.

In this connection water allocation amongst consumers proportionally to available water should be established (to eliminate imbalance in water intake limits between the states).

The following water allocation alternatives are proposed:

1. In period of normal availability and water stock in reservoirs water allocation to make according to established limits.

2. In dry years, using Almaty Agreement of 18.02.92, Article 4, to establish the following criteria for interstate use of limits:

- under water availability lower planned one water diversion is subjected to reduction proportionally reduction within the basin by ICWC;
- establish limit for intake over limits less than 10 % for separate periods;
- in case of overtaking water during certain periods more than10 % BWO “AmuDarya” appeals to MAWRs for urgent meeting in order to consider current situation;
- base for water allocation percentage is current water deficit during given period of time.

3. To establish the following principles of water resources allocation among the states in the AmuDarya basin:

- base for limit establishing is ICWC approved limits over all period for major water consumers;
- while water intake share calculating approved water supply quota to AmuDarya delta and Aral Sea as independent water consumers should be taken into account;
- water allocation percentage among water consumers (with regard for the Aral Sea) is established each 10 days incrementally based on approved limits residue;
- BWO “AmuDarya” is allowed under agreement with MAWRs to correct limits within 10 %.

4. Strict control is necessary over water resources use in all parts of water consumption.

Measures on water saving at national level:

1.Water use discipline strengthening.
2. New irrigation technologies introduction.
3. Canals efficiency increase.
4. New irrigation norm development and introduction.
5. Crop pattern revision.
6. Modern equipment and water registration systems introduction.

ANALYSIS OF QUESTIONNAIRE ON DRY YEAR 2000, PROPOSED AT THE ICWC TRAINING CENTER WORKSHOP IN SEPTEMBER 2000 IN TASHKENT

CIDA and SIC ICWC in Tashkent organized September 18-25, 2000 workshop. Participants were high-level officials from water-related sector of Central Asia. Questionnaire on dry year 2000 was proposed to participants consisting of 14 questions with alternative answers.

Question 1" What negative consequences for you region you can apportion?" 80 % of participants mentioned crop water stress, damage to irrigated farming; 45 % indicated ecological and sanitary-epidemiological situation deterioration and drinking water quality worsening. From other answers (10-20 %) can be apportion: lakes in delta fish productivity reduction, catastrophic reservoir emptying, unsatisfactory psychological state of water consumers.

Question 2 "What are main reasons for dry year 2000?" 80 % participants mentioned low reliability of flow forecast, 60 % - interstate and inter-branch contradictions and limit violation by local authorities; 50 % - poor water registration; 35 % - lack of control over water allocation, low effectiveness of basin management structure and low reliability of information about river flow; 20 % - lack of effective mechanisms for limits correction according to current water availability.

Question 3 "At what management level there were biggest losses of manageability in 2000?" 60 % of participants-basin level; 30 % - national level; 10 % - between basin and national level.

Question 4 "Why downstream was in the worst position ?" It was proposed to give recommendations on this issue as well. Unfortunately, practical recommendations were not given. Common reasons were mentioned like river flow non-regulation (20 %); low discipline of limits observance (40 %); contradictions during deficit (10 %). ICWC and BWO status increase was also proposed.

Question 5 "How to mitigate draught consequences?" 70 % proposed to strengthen control for water diversion; 70% stay for coordination of national and regional efforts; 70 % propose fines for overtaking water and incentive for water saving; 45 % - water saving and rigid norms; 30 % - return water re-use; 20 %-losses reduction and only 10 % wish to improve cropping pattern, public awareness, information exchange (among Hydrometservices, SIC ICWC, local authorities and water-related organizations). Nobody agreed with sanitary releases to canals reduction.

Question 6 "What is role of research organizations in prevention of draught consequences?" Meteorological forecast reliability assessment (60 %); management efficiency assessment including water allocation, reservoir operation regime (60 %); action plan, agreement revision (60 %); economic, ecological and social damage assessment (80 %); flow formation modeling, operational analysis of situation in order to know balance discrepancies reason.

Question 7 "What should be mechanism of water resources allocation?" Real proposal were not given. Opinions about limits based on water quality account were said. On question whether you familiar with BWO proposal positive answer were given by 1/3 of participants.

Question 8 "Is the Aral Sea considered as one of main water consumers?" in draught period the sea should be considered as main consumer (35 %); do not agreed with this affirmation (40%); water supply to Aral Sea have to be cut to a half (15 %); to maintain ecological minimum (10%); to count on ICWC (10%).

Question 9 & 10 "Is it expedient to establish temporal international and inter-sector commission for control of water allocation and special working groups to make operational work from ministries, Hydromets and ICWC?" This measure is expedient (80 %); this proposal is ineffective (15 %).

The following shortcomings in ICWC (SIC, BWO), and Hydromets activity (item 11) were indicated: lack of legal mechanism for interstate water allocation; low ICWC activity: lack

of information exchange; low forecast reliability. As the reasons of this situation lack of financing, ICWC low status were mentioned.

Question 12 “What measures and actions can promote ICWC plans fulfillment?” regular meetings of Head of states, economic sanctions, governments' decrees, mass-media.

Question 13: “Participation in workshop of ICWC Training Center” (95 %)

Question 14: As an example of successful collaboration between Uzbekistan and Tajikistan actions coordination concerning Makhram pumping station were mentioned. It allowed to use 800 mln.cu.m of water from Kairakkum reservoir in SyrDarya middle reaches for irrigation.

Conclusions

Interrogatory can be considered successful. Analysis of opinions allows to prioritize main problems of draught and their solution. Analysis of consequences showed that problem should be solved on basin level analyzing it in time within natural cycles.

Main attention should be paid to analysis of natural and artificial water deficit which is consequence of uncontrolled water intake and water supply irregularity; wrong assessment of water resources available, ineffective management and non-agreed actions of states and economic branches.

Special attention must be paid to: development of measures for flow losses reduction; assessment of draught consequences; introduction of planning; legal mechanism development; information exchange; BWO sphere of action widening.

DIALOGUE: "WATER FOR FOOD AND ECOLOGICAL SECURITY"

13-16 December 2000 IWMI has conducted in its headquarter in Colombo, Sri Lanka international seminar "WATER FOR FOOD AND ECOLOGICAL SECURITY". Initiator of this seminar was new IWMI director Frank Riesberman, former director Holland "Resources Analysis", one of the authors of "World Water Vision"-main document of Second World Water Forum in Hague.

New dialogue supposes to develop international cooperation for provision of food security and ecological sustainability. Action plan is supposed to be presented on the Third World Water Forum in 2003 in Tokyo.

Food demand is determined by number of population: now it is 6 billions and after 25 years it will be 8 billions. About 80 % of population live in developing countries. 84 % in developed and 56 % in developing countries will be urban population. According to FAO today 86 % of countries have food deficit (less than 2200 kilocalories/day per capita). Among these countries there are China, India, Indonesia, Pakistan, Nigeria, etc. There are three main sources of food: crop growing, cattle breeding and fish culture. Crop cultivation gives 77.5 % of food, cattle breeding – 15.9 %, fishery - 6.6 %. There are 1500mln.ha of arable lands from which only 250mln.ha (17 %) are irrigated. Non-irrigated lands give 60% of production and irrigated lands-40 %. Irrigation uses about 70 % of water consumed by mankind. In turn, irrigation is considered as one of main factor destabilizing environment (including Central Asia). It is evident that this problem should be managed at all levels.

135 specialists from 40 countries took part in the seminar (45 % - hydrologists; 25 % - ecologists; 20 % - sociologists; 10 % - agronomists). This composition is witness of integral approach. Representatives of international organizations (FAO, GWPICID, WMO, WWC, UNDP) also were presented. Dr. V. Sokolov participated from Central Asia.

All participants were divided into 7 working groups consisting of representatives from different regions and various disciplines. Three major questions were subjected to discussion:

- Revelation of common and different approaches presented in two main documents on the Second World Water Forum: "Vision of Water for Food and Rural Development" and "Vision for Water and nature".
- Definition of future vision "water for Food and ecological Security" structure with regard for hypothesis, methodology, etc.
- Mechanism of future vision preparation (executives, working schedule, necessary means, pilot projects selection).

Each group after each day discussion presented its proposals. It is worth to note that all proposals differed each other. There was a task for organizers to compile all these proposals in single document.

Final concept envisages two types of activity: dialogue (information and ideas exchange) and integrated assessment of ways to increase productivity of water used for poverty elimination and ecosystems maintenance. Assessment will be made based on example of local and regional projects coordinated by GWP. Pilot projects should encompass as much as possible regions with regard for their peculiarities, potential and macroeconomic factors. They should be implemented at least in 4 typical conditions:

- In the regions with developed infrastructure where possible ways of water productivity increase could be shown (water expenses per production unit).
- In the regions with significant potential for development (new reservoirs construction, irrigation development).
- In the regions with water deficit (how to combat starvation and stabilize ecosystems).

- Participants agreed, that countries in transition (CIS and Eastern Europe countries) should be distinguished in separate type of pilot projects to restore developed infrastructure and increase water productivity. Aral Sea basin should be presented as separate project.

IWMI has taken responsibility for preparing to spring 2001 program of concrete actions and submit to participants for consideration. Close collaboration of SIC ICWC and IWMI within the framework of the project in Fergana valley will be a base for dialogue "Water for Food and Ecological Security".

Protocol of "INCO-COPERNICUS" (ICA-CT-2000-10039) project participants' meeting

14-15 February 2001 Almaty

Participants:
1.V. Dukhovny, SIC ICWC Director
2.V. Sokolov, SIC ICWC Deputy Director
3.M. Khorst, SANIIRI Leading researcher
4.G. Stulina, SANIIRI Leading researcher
5.K. Kulov, KYRGNII Irrigation Director
6.D. Suyumbayev, Kyrgyz Agrarian Academy, Chairman
7.R. Gorbachyova, KYRGNII Irrigation Leading researcher
8.P. Zhooshev, KYRGNII Irrigation Leading researcher
9.Ya. Pulatov, TajNIIGiM Director General
10.N. Kipshakbayev, SIC ICWC Kazakh branch Director
11.K. Moldabayev, SIC ICWC Kazakh branch Bookkeeper
Chaired by Prof. V. Dukhovny (SIC ICWC).

About project activity on the second half of 2001

Participants indicated with gratitude that European Union has started to finance the project.

Additionally to the report submitted to Coordinator and EU executors have being done following work:

a) ISAREG and KCISA model programs as well as Lisbon Agrarian University recommendations on surface irrigation have been translated into Russian and issued as a brochure;
b) FAO publication #24 "Crop water consumption" also has been translated and issued;
c) INCO-Copernicus guidelines concerning technical and financial reporting have been translated and disseminated among participants;
d) Working documents and schedules for all program's packages have been prepared;
e) Inventory and format for regional projects implemented in Central Asia in water sector and irrigated farming have been developed and prepared.

Discussion of all these documents will allow to work out the following decisions for joint performance:

1. On the Component RP-1

To agree with ideology and proposals for its development presented by SIC ICWC. To ask all participants to submit comments and proposals to this component during February. SIC

ICWC to submit at 1st of April tree of objectives format with codification of main elements in order to create opportunity for all executors to develop appropriate direction of activity.

Project inventory at national level will be complemented by all executors until 1st of May 2001. SIC ICWC will present to all co-executors electronic version of bibliography to permit them to complement it with national publications. Web site version will be worked out by SIC ICWC at 1st July 2001 and submitted to executors for coordination. Database creation will be presented as joint work of all executors.

2. On RP-2. Information system/GIS

2.1. Participants agreed with ideology and proposals of SIC ICWC on RP-2. To ask all participants to give their proposals and comments until 1st of March 2001.

2.2. SIC ICWC takes responsibility for database preparation on Fergana valley based on WARMIS until 15th of March 2001.

2.3. Until 1st of March SIC ICWC prepares structure of tables for Fergana valley typology description in general (water block, irrigated lands block over oblasts and rayons, social-economic block over oblasts) and send it to co-executors-KyrgNII Irrigation and TajNIIGiM which present information until 1st of May 2001 for 1997-1999.

2.4. SANIIRI gathers data from WUFMAS database over farms of Fergana valley until 15th of March 2001.

2.5. SIC ICWC jointly with SANIIRI until 1st of April 2001 (but not later 1st of May 2001) prepares structure of tables for information required for models (at farm and field level). Based on these tables executors organize data collection and its admittance to SIC ICWC once a month.

2.6. SIC ICWC jointly with SANIIRI develop modeling database interface until 1st of October 2001.

2.7. SANIIRI, KyrgNII Irrigation and TajNIIGiM until 27th of March 2001 prepare and pass to SIC ICWC major information on selected farms and fields (according to SIC ICWC proposals to RP-2) for Prof. Pereira during his next visit (March 28- April 12 2001).

2.8. SIC ICWC until 15th of April prepares full scale working program on GIS and satellite imaginary processing and passes it to co-executors. KyrgNII Irrigation and TajNIIGiM simultaneously select topographic maps (scale 1:100000) on Osh and Sugd oblasts as well as soil and water allowance zoning data.

2.9. SIC ICWC makes agreed covers digitizing until 1st July 2001.

2.10. SIC ICWC summarized database for Fergana valley in electronic form will be passed to co-executors.

2.11. Until 1st of April 2001 it is necessary to survey selected farms with GPS.

2.12. Participants agreed with expedience of financial means consolidation for satellite imaginary acquisition (or fragments with farms).

2.13. SIC ICWC agrees until 1st of July with European partners methodology of vegetation indices assessment on satellite images.

2.14. Along with satellite images acquisition SIC ICWC together with SANIIRI analyze these images.

2.15. All co-executors until March 2001 must give proposals on methodology of results dissemination at the regional level.

3. On RP-3. “Requirements for irrigation and irrigation scheduling” and RP-4 “Irrigation systems and practice”

3.1. Participants agreed with proposed by SIC ICWC RP-3 work content. To ask all participants to give their comments and proposals until 1st of March 2001.

.2. Participants affirmed readiness to start field investigations since 20th of February 2001 on selected fields according to protocol dated 27th of June 2000 (Annex 1).

3.3. Until 20th of February KyrgNII Irrigation and TajNIIGiM submit to SIC ICWC (by e-mail) analysis inventory according to item 6 which will be executed by themselves.

Rest of analyses including pF characteristics (available moisture, wilting point, etc.) on membrane press is considered expedient to charge SANIIRI on contract basis.

3.4. Participants confirmed that necessary equipment is ordered independently by each partner.

3.5. For cotton and wheat water consumption study partners have ordered necessary equipment urgently.

3.6. Participants confirmed start of test calculations on ISAREG and KCISA programs using available information on climate, crops and soils and translated guidelines.

4. Parties have agreed on the following organizational questions:

4.1. All project contractors prepare technical and financial documents according to Inco-Copernicus rules and forms.

4.2. Payments from bank account in Almaty will be executed according to work fulfilled with reserve for next three months.

4.3. Sub-contracts will be made in single form agreed by SIC ICWC with Major Contractor.

4.4. Subsistence size is agreed as follow: in capitals and large cities $15 per day plus accommodation cost according to receipt; in rural area-$10 per day.

4.5. To charge Prof. V. Dukhovny to agree with Prof. L. Pereira workshop on field work organization and programs adaptation in the beginning of April with regard for Prof. Pereira visit. To ask all contractors to inform about workshop's participants (programming specialists and technologists, not more 4 man from each country) until 1st of March 2001.

4.6. Parties agreed to distribute brochures translation and issue cost among the partners proportionally to financing volume.

Signatures:

V.Dukhovny
V.Sokolov
M.Khorst
G.Stulina
K.Kulov
Ya.Pulatov

ICWC DELEGATION STUDY TOUR TO USA-CANADA WITHIN FRAMEWORK OF McGILL-ICWC TRAINING CENTER PROGRAM

ICWC delegation consisting of A. Nazirov, Minister of Water Resources Management of the Republic of Tajikistan, N. Ashurov, First Deputy Minister, A. Jalalov, First Deputy Minister of Agriculture and Water Management of the Republic of Uzbekistan, B. Koshmatov, Deputy Minister of Agriculture and Water Management of the Kyrgyz Republic, L. Dmitriyev, Kazgiprovodkhoz Director, Z. Jurabekov, BWO "Zerafshan" Director, M. Khamidov, BWO "SyrDarya" Director, Yu. Khudaibergenov, BWO "AmuDarya" Director, V. Dukhovny, SIC ICWC Director visit USA and Canada to meet various water-related and ecological organizations there.

Delegation have visited in USA:

"Riverside Technology Inc." - private consultancy in Colorado state modeling hydrologic and water-related processes;

Irrigation district "North Colorado Water Conservation" - one of districts managing water resources in South Plate river basin;

National Park Rocky Mountain;

US Bureau of Reclamation - major body responsible for state water systems development and support in 17 western states;

Colorado State Engineer for Natural resources;

Delegation have visited in Canada:

"National Water Resource Institute branch – national research center for water resources;

Administration for agricultural prairies conservation PFRA;

Saskatchewan Irrigation and Diversification Corporation dealing with soil conservation, irrigation and farming technologies;

SaskWater – governmental body responsible for water supply to farmers;

Gardner dam and reservoir complex;

SaskWater pumping station for 12 th. ha lands irrigation;

HydroQuebec – governmental body responsible for hydropower structures operation, reconstruction and development;

Quebec Ministry of Agriculture;

Quebec Ministry of Environment;

Quebec Ministry of Industry;

McGill University where workshop "Canada-Aral Sea" has been held;

Canada Ministry of Environment;

Canadian Agency for International Development;

Canada Ministry of Justice to discuss disputable questions in water right;

Joint International Commission Canada-USA.

Visit demonstrated that Canadian society presents brilliant example of good combination and regulation of demand and opportunities with regard for ecological restrictions and necessity to maintain nature for future generations; water resources are important part of ecological management.

ALMATY MINISTRY CONSULTATION

Consultation of the Ministries of economy/finance and ecology on water and investments management in NIS was hold from 16 to 17.10.2000 in Almaty under the aegis of Group on Ecological action program embodiment for Central and East Europe.

The goal of the Ministries meeting was to unite the decision- making process on economic and ecological problems and, thus, introduce the contribution to the NIS development.

There are a lot of problems in NIS water sector connected both with quality and quantity of water. These problems are different in each region both in civil and urban, and in some cases are transboundary problems. More effective means on water resources management is integrated approach based on river basins. Effective water resources management both at national and transboundary levels is important for world and safety in region.

Priority object in NIS is water supply and sewerage, because they direct influence on health of urban population.

Crisis in urban water sector requires integration of decision-making process in economic and ecological field. Governments should take into account the ecological expenditures and benefits in addition to other expediters and benefits and find less expenditure decisions. There are huge possibilities of simultaneous achievement of economic and ecological objectives (entitled: the policy of "Double benefit "). New methods of project and program assessment should be accepted in NIS, in order to, on economic base, compare the water supply and sewerage improvement with other competes needs. For this purpose it is necessary to information base strengthening, political advisors training and decision-making process reformation. NIS governments can achieve it with the help of donors. Agencies are responsible for ecology, economy and finance should follow the policy of governments.

The key role in water supply and sewerage sector rehabilitation as well as capital investments, social protection and access to credit should play the national and local budgets of NIS. For process sustainable the national company participation should be encouraged and capacity building strengthened under tender preparation. In further the source of financing for system operation and maintenance should be payment of user.

New policy and institutional structure for investment support are necessary for urban water sector reformation, which will be important for investment mobilization. For sustainable development, the urban water sector should be integrated into the basin schemes management and other government programs.

Successful reformation in water sector will depend on readiness of SIC government to develop the economic reforms in their counties. The first object is stopping the destruction of the water supply and sewage systems, which provide sustainable provision population with necessary needs. Reforms require long-standing efforts. In this process the governments and donors as well as NGO participation and all water users are play the key role.

ABOUT THE TRAINING CENTER ACTIVITY

The next session of courses on water specialist qualification improvement in Central Asian was hold in Tashkent during 11-21 December 2000.

Listeners of BWO and oblvodkhozs of Central Asia during 10 days have heard full course on "Integrated water resources management" and took part in discussion of regional and national problems, elaboration of practical recommendation on rational water resources use and protection, improvement of irrigation productivity and water saving as well as institutional forms of water management at different level.

Participants have elaborated the recommendations and proposals for national and water management bodies:

At regional level:

Rapprochement of water legislation of states of region in order to integrated management and transboundary water protection, operation measures fulfillment, emergency situation on transboundary water objects prevention and elimination;

Ensuring free access to water objects and buildings, which are located on the territory of neighboring side, duty free transportation of materials and equipment for such objects;

Development and fulfillment of the joint measures on water pollution prevention;

Development of legal mechanism of regional collaboration on joint use and transboundary water prevention and information exchange;

Establishment of production of measuring means, equipment and automation means on water objects, calibrating and verification of hydrometric equipment;

Preparation and training on water resources management;

Support of regional water organization activity;

Cooperation and regional specialization of agricultural production;

At national level:

Modernization and renovation of base funds and technical equipment of water structures and objects;

Improvement of water legislation, investment and tax policy;

Introduction of more improved economic mechanism on water resources pollution prevention, water expediters in branch of economy reduction; provision of ecological sustainability in the river basin and their nature;

Irrigation and drainage systems reconstruction fulfillment;

Staff preparation.

At local level within dehkan farms:

In-farm irrigation system operation and maintenance improvement;

Development of water saving technologies and water saving itself;

Maintenance of agromeliorative requirements;

Creation of water users association and their activity support;

In-farm water account establishment and maintenance of irrigation regimes with reduction of water discharge per 1 product.

PROTOCOL OF THE MEETING OF WATER EXPERTS OF CENTRAL ASIA STATES - LISTENERS OF TRAINING CENTER OF SIC ICWC AND McGILL UNIVERSITY (CANADA) ON THEME ''INTEGRATED WATER RESOURCES MANAGEMENT''

Tashkent **January 31, 2001**

During January 22-31, participants of training have heard the full course on theme "Integrated water resources management" and led active discussion of stated regional and national problems, launched the attempts to elaborate the practical recommendations on rational water resources use and protection, water management forms improvement at different levels of management taking into account developed forms, methods and directions of water management system reforms.

Participants of training are chiefs and deputy chiefs of regional water management organizations (in some cases basin organization), head specialists of water management bodies of Central Asia Republics.

Kazakhstan	S.E. Isanbekov, T.K. Ordabaev, B.M. Nametov, D.R. Raimakulov
Kyrgyzstan	N.B. Kokoev, B.E. Matraimov, Z. Malikov, A.A. Takyrbashev
Tajikistan	B.H. Aliev, A. Korichumaev, M.N. Nishonov, I. Khalimov
Turkmenistan	S. Aganov, B.A. Anaev, V.I. Pruchkin, B. Redjepov
Uzbekistan	T. Mirzanazarov, M. Faizullaev, G. Hudaiberdiev, J. Sharipov

Moderators are A.A. Jalalov, First Deputy Minister of Agriculture and Water management of the Republic of Uzbekistan, Professor N.K. Kipshakbayev, Director of Kazakh Branch of SIC ICWC, A.Sh. Djailoobayev, Chief of Water Management Department of Minselvodhoz of the Kyrgyz Republic. Each participant has received programs of lectures and text of reports for preliminary acquaintance and questions preparation for debates. Lecturers' reports in methodical plan are presented in form of text with modern means of training on a base of computer technology and technique. Video-materials on different aspects of water resources in the Aral Sea basin use and materials of WARMAP, WUFMAS, GEF regional projects fulfillment are widely used. During 3 days the participants have heard the full course of computer literacy. Then participants have prepared own presentations.

Listeners pointed out wide number of questions in field of water management, rational water use in different sectors of economics and irrigated lend. Listeners pointed out historical and geographic community of Central Asian republics, combined by common AmuDarya and SyrDarya rivers of the Aral Sea basin, have expressed the opinion on further regional collaboration, have given positive evaluation to measures on regional organizations collaboration undertaking in region.

Listeners have agreed with necessity of hydrographic principle in water resources use and supported necessity of clear sharing of management functions, tasks and powers at all levels from farm and local bodies to regional water management organizations.

Necessity of public involvement in management process with functions and powers sharing and transfer is pointed out. Positive tendency of new democratic ways of management in forms of water users associations establishment was pointed out. In some countries of the region the agriculture reform is conducted without affect water management system and water users associations creation become forced react step to agrarian reforms. In this connection there is necessity of reforms in complex, interaction and within governmental program conduction taking into account governmental support in economic and social aspects.

Listeners have heard reports on Components A-1 and A-2 of GEF Project (Water resources management and environment protection in the Aral Sea basin) - water and salt management at the regional and national levels in the Aral Sea basin.

Listeners pointed out the necessity of active work with public on different aspects of water management, population involvement into water management and mass-media use on problems of rational water use.

Listeners pointed out lacks in staff policy of CAR water management, which can affect on water management system stable functioning in nearest future.

Participants have expressed the preoccupation about financing of water management systems that result in water management funds loss in nearest future.

Participants pointed out that at present time organizations have shortage rights for successful work.

Suggestions proposed by participants for taking into account under planning and measures on water management stable operation fulfillment are as follow:

1. At regional level

In interest of all states for collaboration in field of water resources use, including control and harmful impacts consequence elimination it is necessary to undertake measures on water and water protection legislation rapprochement;
Water meter means, devices and hydrometric equipment production;
Staff preparation and training in field of water resources management and water specialists' qualification improvement;
Joint measures on hydrometeorology services possibilities increase;
Establishment of regional conferences, workshops on different water management aspects;

Activities support of regional water management organizations by means of their role increases and base strengthening.

2. At national level

Water management measures fulfillment within the governmental program;
Improvement of water legislation, investment and taxes policy;
Main funds of water management complex modernization and updating;
Irrigation system complex reconstruction, including in-farm systems;
Development of services in agriculture;
Staff preparation.

3. At local and farms level

Water users association establishment and governmental support at the first stage;
Water saving technology development;
Introduction of payable water use and further development;
Agroreclamation requirements strict observance;
In-farm water accounting establishment and irrigation regime observance;

Participants pointed out the necessity of close collaboration with Training Center of ICWC and Training Center Branches establishment.

Participants thank employees of Training Center, all lecturers and moderators, SIC ICWC, BWO “SyrDarya” and Ministry of agriculture and water management of the Republic of Uzbekistan, which provided, at high level, lectures conduction, acquaintance with operation of water system and constructions.

MINUTES OF THE MEETING OF WATER EXPERTS OF CENTRAL ASIA STATES - LISTENERS OF TRAINING CENTER OF SIC ICWC AND McGILL UNIVERSITY (CANADA) ON THEME ''INTEGRATED WATER RESOURCES MANAGEMENT''

Tashkent **March 1, 2001**

Since February 19 till March 1, 2001, participants of training have heard the full course on theme "Integrated water resources management" and led active discussion of stated regional and national problems. In the result participants have elaborated practical recommendations on rational water resources use and protection, water management forms improvement at different levels of management taking into account developed forms, methods and directions of water management system reforms.

Participants of training are chiefs and deputy chiefs of regional water management organizations (in some case basin organization), head specialists of water management bodies of Central Asia Republics.

Kazakhstan	G.A. Ashenov., T.M. Bapakov., B.Z. Danbayev., B.K. Nuraliev
Kyrgyzstan	A.M. Gorelkin., V.G.Gutnic., B.E. Matraimov., A.B. Jarkynov
Tajikistan	A. Kaumov., M. Parpiyev
Turkmenistan	A. Berdiev., B. Radjapov., M.M. Sarkisov
Uzbekistan	A. Abdurahmanov., B. Buriev., U. Pirnazarov., N. Catimbaev., A. Khasanov

Moderators are N.K. Kipshakbaev, SIC ICWC Kazakh Branch Director, A.A. Jalalov, First Deputy Minister of Water and Agriculture Management, M.M. Sarkisov, ex-Director of Turkmengiprovodhoz. Each participant has received programs of lectures and text of reports for preliminary acquaintance and questions preparation for debates. Lecturers' reports are presented in form of text with modern means of training on a base of computer technology and technique: video-materials on different aspects of water resources in the Aral Sea basin, materials of WARMAP, WUFMAS, GEF, ISEAM regional projects fulfillment. During 3 days the participants have heard the full course of computer literacy. Then participants have prepared own presentations.

Listeners pointed out wide number of questions in field of water management, rational water use in different sectors of economics and irrigated lend. Listeners pointed out historical and geographic community of Central Asian republics, combined by common AmuDarya and SyrDarya rivers of the Aral Sea basin, have expressed the opinion on further regional collaboration, have given positive evaluation to measures on regional organizations collaboration undertaking in region.

Listeners have agreed with necessity of hydrographic principle in water resources use and supported necessity of clear sharing of management functions, tasks and powers at all levels from farm and local bodies to regional water management organizations.

Necessity of public involvement in management process with functions and powers sharing and transfer is pointed out. Positive tendency of new democratic ways of management in forms of water users associations' establishment was pointed out. In some countries of the region the agriculture reform is conducted without affect water management system, and water users associations creation become forced react step to agrarian reforms. In this connection the necessity of reforms in complex conduction should be part of the governmental program and supported by the government in economic and social aspects.

Mr. Joop de Shutter, "Resource Analysis" Director, Mr. Jacob Iohan (ISEAM Project) also have presented their reports on the training. On the meetings have attended Mr. Duglas Turki the representative of OSCE, Mr. Spreafico, Mr. Kreanbul and Mr. Sh. Mirzaev the representatives of Swiss Development Agency.

Listeners have heard the reports of R.A. Giniyatullin, GEF Agency Leader and directors of A, B and D components of GEF Project (Water sea sources management and environment protection in the Aral Sea basin) - water resources and salt management at the regional and national levels in the Aral Sea basin and water saving technology introduction, public participation in water resources management and dams safety.

Listeners are satisfied with content of lectures, technical equipment, living arrangement and have expressed wish to supplement the content of lectures by subjects metrology, ecological and water users association problems more widened consideration as well as problems of hydrometeorology for true forecast provision.

Listeners pointed out the positive operation of basin water organizations of the Republic of Kazakhstan successfully fulfilling the basin water resources management on hydrographic principle.

Listeners pointed out the necessity of more active work with public on different aspects of water management, population involvement into water management, mass-media involvement into problems of rational water resources use, especially, in low water years.

Listeners pointed out lacks in staff policy of CAR water management, which can affect on water management system stable functioning in nearest future.

Participants have expressed the preoccupation about financing of water management systems that result in main, water management funds loss in nearest future.

Participants pointed out that at present time organizations have shortage rights for successful work.

Suggestions proposed by participants for taking into account under planning and measures on water management stable operation fulfillment are as follow:

1. At regional level

Regional collaboration strengthening with public involvement on transparent and parity base. Developed Agreements signing;

Creation of stable financial mechanism of regional organizations operation and provision with rights, corresponding to international status; granting certifications on free broader across to all staff of international organizations;

Development and strengthening of staff qualification improvement on water resources management;

Strengthening of BWO control service during vegetation period;

Joint activity of hydrometeorology services improvement directed to correctness forecasting and water resources accounting; hydromet service rehabilitation on glaciers of the Republic of Tajikistan and Kyrgyzstan for correct forecasts obtaining;

Regional conferences, workshops establishment on different aspects of water management;

Computerization and net capacity development of regional water organizations and their base strengthening;

Large constructions gradual transfer on local automation, then on remote management on the whole;

Introduction of limited both quantity and quality discharges to AmuDarya and SyrDarya rivers with penalty payment for their exceeding, at expense of this to establish the ecological fund on water quality improvement;

Creation of common fund of CAR on rehabilitation from natural disasters in water management organizations;

Creation of interstate inspection on water resources protection;

Control for water quality between neighboring countries establishment;

Ask ICWC to create BWO "Zerafshan" in structure of ICWC between Uzbekistan and Tajikistan;

Representatives from Kazakhstan have proposed two suggestions related to water sharing improvement on Shy and Talas rivers: create BWO "Shy-Talas" under ICWC between the Republic of Kazakhstan and Kyrgyzstan; and to consider the situation with polluted water discharge to the rivers (Shy, Toktash, Shargo, Karabalta).

2. At national level

Create at national level the mechanism (inter-department coordination commission, Government meeting etc.) of annual work plan (limits, regimes, schedules etc.) agreement between water management organization, main water users (domestic services, agriculture, power, chemical, mining and metallurgy industry) and environment protection organizations in order to balanced water supply obtaining by terms, quantity and quality as well as action plan on water management;

Water legislation, investment and taxes policy improvement; introduction of payable water use differentiated for different water users, which can cover costs on water management financing;

Governmental support of water management;

Hydrologic account and forecasts on local sources: small rivers, streams etc.

Interstate agreements and national legislation unification;

Staff preparation improvement;

Regional information net and database development at oblast and system levels;

Accelerate introduction of electronic technologies (informatic, telemetric, remote management, modeling etc.) at all levels and activities (decision making process, retrospective, operative and perspective analysis, forecasts, plans etc.);

Introduction of computer programs of support and calculations;

Kazhydromet rehabilitation for current and future water balances composition;

Special water fund of Committee on water resources creation for water management problems solution;

Representatives from Kazakhstan have suggested to consider the creation of water body under Water Management Department or under Ministry of Water Management at national level and under ICWC at regional level;

3. At local and farms level

Water users association establishment and governmental support at the first stage;

Water saving technology development;

Introduction of payable water use and further development;

Agroreclamation requirements strict observance;

In-farm water accounting establishment and irrigation regime observance;

Use institute of "Furthers Council" and Mirabs under local administrations and/or community (where applied) as key decisions makers.

Non-governmental organizations potential use for irrational natural resources use on the whole and water resources use factors revelation.

Listeners pointed out the necessity of close collaborations with Training Center of ICWC and Training Center Branches establishment.

Participants thank employees of Training Center, all lecturers and moderators, SIC ICWC, BWO “SyrDarya” and Ministry of agriculture and water management of the Republic of Uzbekistan, which provided, at high level, lectures conduction, acquaintance with operation of water system and constructions.

For more information about Training Center activity go to

http//tc.aral-sea.net

THREELETERAL SURVEY MEETING ON UNDP PROJECT "POTENTIAL OF THE ARAL SEA BASIN DEVELOPMENT"

Three-lateral survey meeting of UNDP, IFAS, and ICRM representatives have been hold on January 30, 2001.

Mr. A. Demidenco, leader of project has presented the annual report on project. One of the project achievements became revival of ICRM activity as well as creation of net of experts on region stable development and assessment methodology of resources management development.

During meeting it was pointed out that EC IFAS each two years movement decrease the effectiveness and sustainability of fund management as well as affords on capacity building undertaken by projects. However, EC IFAS chairman have declared that during last two years fees of five Central Asian States are increased from 25-35 to 80 %, in total more $ 38 mln. per year.

Luck of monitoring from UNDP and NIS country representatives is pointed out.

IFAS representatives have expressed the desire that UNDP will take more active part in strategy development in order to Aral Sea crisis solution and UN Convention on the Aral Sea basin stable development preparation.

Decision about project continuation till October 1, 2001 as planned earlier was adopted on a base of decisions and opinion expressed by main project donors (the Government of Netherlands), as well as other donors, involved in technical assistance provision to RPABM.

At the same time the following consent was achieved:

1. It is necessary that agenda of the next IFAS/ State Heads meeting (preliminary planned on April 2001) include question about EC IFAS permanent location with chair rotation maintain.
2. It is necessary to eliminate IFAS and ICRM periodic expenses (administrational and operational) from project side and develop the strategy on donors support exception.
3. It is necessary to processes connected with IFAS financing from Central Asian States side (fees, appropriation and costs) become more clear.
4. In order to evaluate the above mentioned recommendations fulfillment it is necessary in June 2001 conduct the meeting of all sides involved in to project,
5. UNDP assign the expert on consultations provision in field of policy and immediate monitoring of above recommendations fulfillment in order to report on meeting in June 2001.

WORKSHOP RESOLUTION (FEBRUARY 22-23, 2001) ON HYDROLOGY REGIONAL CENTER CREATION

1. National hydrometeorology services (NHS) came to agreement about Regional Center on Hydrology (RCH) creation in Dushanbe and its departments in each NHS of Central Asia.

2. Collaboration within RCH based on parity of all NHS of CA.

3. Define as a priority directions of RCH activity as following:

- flow forecast;
- monitoring;
- information and net;
- training;
- hydrometeorological equipment and devices production including operation and maintenance.

4. Apply to EC IFAS with proposal about RCH establishment under aegis of EC IFAS with granting to RCH legal status.

5. Strategy of RCH work should be directed to optimal satisfaction of users.

6. One of main tasks of RCH is donors investments involvement and effective use in field of hydrometerological services development.

7. It is expedient for NHS and EC IFAS leaders apply with proposals about Interstate Hydrometeorological Commission creation to Central Asian Sates governments.

8. Participants applied to Swiss Mission on Aral Sea to start RCH work and develop the work plan on 2001.

From NHC of Kazakhstan	E.K. Kubakov
From NHC of Kyrgyzstan	M.T. Bakanov
From NHC of Tajikistan	M. Kazakov
From NHC of Uzbekistan	L.N. Borovicova
From SMAS	M. Spreafico

PROTOCOL
on the meeting results of the representatives of National Hydrometeorological Services of Central Asia (NHS), USA Agency on International Development (USAID), USA National Agency on Ocean and Atmosphere (NAOA) and Project on Natural Resources Management Improvement (PNRMI)

February 24, 2001 Tashkent

Participants of the meeting of the representatives of NHS of Central Asia and USAID/NAOA/PNRMI have heard and discussed:

- statement of NAOA representative about project fulfillment on the Aral Sea basin river flow forecast system creation;
- report on planned activities after equipment installation for satellite information receiving.

Confirming importance of this project in forecast system reliability and monitoring in the region improvement came to consent:

1. In order to further coordination of data collection and exchange, requirements unification for melted and river flows forecast development, NHS specialists training, as well as new technologies development, it is necessary to establish the coordination group from representatives of NHS on the Aral Sea basin river flow forecast (CGFF).
2. Each NHS has rights on one representation in CGFF.
3. Ask for NHS of Central Asia to assign their representatives in CGFF and inform USAID about it.
4. Apply to USAID with request to prepare and conduct the organizational meeting of CGFF in March-April 2001.
5. CGFF coordinate its work program with Regional center on hydrology, consultants from NAOA and PNRMI.

Representatives of NHS applying to administration of USAID/NAOA/PNEMI with request to accelerate:

a) equipment and software supply for information transfer to NHS from ground receiving station of NAOA ;
b) supply of operation stations to NHS for melted flow forecast;
c) NHS specialists training.

Minutes has been signed:

From Kazhydromet
Chief engineer of Kazhydromet E. Kybakov
From Kyrgyglavhydromet
Head of Kyrgyzglavhydromet M. Bakanov
From Tadjikglavhydromet
Ferst deputy head of Tadjikglavhydromet M. Kazakov
From Glavhydromet of RUz
Deputy director CANIGMI L. Borovicova

CONFERENCE, ORGANIZED BY PROGRAM "NATO - SCIENCE FOR PEACE"

March 14-16, 2001 Mr. Kris Velispere, director of "NATO- science for peace" Program has organized the conference of the NATO Project coordinators on two directions:

- intellectual property and works licensing, fulfilled in Program "NATO- Science for Peace" ;
- work fulfillment discussion on confirmed and operating projects.

Conference - workshop has been hold in "Colos" Hotel in Moscow, more 100 participants from NATO countries and recipients - projects from NIS and Western Europe, as well as

from Uzbekistan Mr. T. Rashidov, member of the Academy, Prof. V.A. Dukhovny, director of SIC ICWC and Mr. Mahkamov, doctor of technical science have taken part.

Detailed reports, prepated by Prof. A. Hay and D.Ransay, Licence expert services of USA/Canada, A. Saloshata and V. Knappe the represantatives of LES Union, Mr. Medvedev the representative of LES Union in Russia and Mr. Cabo Cap the patent expert from Hungary was presented. Each listeners have received textbooks on English language where reflected some different approaches of European Union and USA in field of intellectual poverty. Nevertheless, Mr. Velispere emphasized, that NATO (unlike of the World Bank and European Union Projects) is not owner of designs, which will be done within NATO Program. This question should be regulated in the agreement between all partners-participants of NATO Project in recommended and presented context of the agreement.

Discussions are conducted and the following information is obtained:

1. All executors should present the intermediate report on NATO to April 20.
2. NATO Project is enough flexible in proposed changes according to estimate within confirmed sum.
3. All equipment purchased by NATO should have (Label).
4. It is permitted to request about advanced payment for co- executors.
5. It is necessary the intermediate report result put on NATO site.
6. All information, related to project, should addressed to headquarters.
7. NATO (Dr. Allan Juber) has expressed desire to organize "Summer lectures" on theme "Transboundary water resources - ways of their solution" in Training Center of SIC ICWC, as well as organize on our base the same courses on "Earthquake-proof construction".

A. Hay and D. Ramsey the representatives of the course have agreed on translation and copying of their reports.

One copy of all reports has passed to Patent department of the Republic of Uzbekistan.

INTEGRATED WATER RESOURCES MANAGEMENT

Collection of scientific works of SIC ICWC has been published. Elected reports from lectures of Training Center of ICWC on water specialists' qualification improvement are presented in collection, which consists of the review of advanced world experience and illustrate perspectives of modern water management of Central Asia development.

The collection consists of two volumes and contains the following materials:

Volume 1

V.A. Dukhovny Integrated water management and its feature on transboundary rivers

N.K. Kipshakbayev Major factors which are taken into account in the scripts of water resources development

T.T. Sarsembekov Water and food safety. Short review of some problems of world water resources, food supply and irrigation

V.I. Sokolov World experience of hydrografic water resources management

A. G. Sorokin Water resources management objects. Water reservoir flow regulation

A.I. Tuchin Tasks and models of river regime management in condition of uncertainty flow

I.S. Avakyan, M.T. Ruziev, B.G. Prikhodko Socio-economic model as system of decision-making support

M. G. Khorst About participation of WUFMAS (TACIS) Program in efficiency irrigation improvement

Volume 2

A.A. Jalalov Ecological aspects of water resources management on rivers - mechanisms of limitation and regulation

M.H. Khamidov About principles of sharing and transboundary water resources of the SyrDarya river basin management in modern policy - economic of Central Asia

A.I. Leshnsky Low water level in the SyrDarya basin in modern conditions of water organization operation

M.A. Pihasov Perfection of in-farm irrigation system management on the basis of water users association creation in conditions of transition to market economy

N.N. Mirzayev Problems of water consumption perfection by means of water users organizations creation and experience of agriculture and water management reformation in CAR

E. M. Roschenko, S.G. Jerelieva Geographic information system in water resources management

V.I. Socolov, U.S. Ukhalin, L.V. Tiy Information systems and database in hydrographic water resources management.

The materials of the collection also are accessible on English language.

If you are interested in above information, the application direct to

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Designed by
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