INTERSTATE **C**OMMISSION for **W**ATER **C**OORDINATION In CENTRAL ASIA	**BULLETIN № 1 (70)**	August 2016

CONTENTS

PARTNERSHIP BASED ON GOOD NEIGHBOURLINESS AND HISTORICAL FRIENDSHIP (VISIT OF THE PRESIDENT OF THE REPUBLIC OF KAZAKSTAN TO THE REPUBLIC OF UZBEKISTAN)

(EXTRACT)

Upon the invitation of Islam Karimov, the President of the Republic of Uzbekistan, Nursultan Nazarbayev, the President of the Republic of Kazakhstan, visited Uzbekistan on April 14.

Islam Karimov and Nursultan Nazarbayev discussed the current state and prospects for development of relations between Uzbekistan and Kazakhstan in various fields, as well as regional and international problems.

The Presidents have underlined that transboundary rivers in Central Asia are common heritage; regional stability and prosperity depend on reasonable and equitable use of these water resources. When considering construction of hydraulic structures on transboundary rivers, it is necessary to strictly follow the generally recognized norms of the international water law enshrined in the UN Conventions and other international documents.

It was underlined that the International Fund for saving the Aral Sea is a main platform for the implementation of projects and programmes aimed at environmental rehabilitation and addressing social and economic problems in Prearalie.

Source: “Jakhon” News Agency

THE PRESIDENT OF THE REPUBLIC OF TAJIKISTAN EMOMALI RAKHMON WILL LEAD THE UN GROUP ON WATER CHALLENGES

At the 72nd session the presidency of the United Nations Economic and Social Commission for Asia and the Pacific (ESCAP) was passed to Tajikistan.

ESCAP Executive Secretray Ms.Akhtar Shamshad in her speech having congratulated the Leader of the Nation, the President of the Republic of Tajikistan, His Excellency Mr. Emomali Rakhmon for being elected as the Head of the UN Group on Water Challenges, has stressed that the role of Tajikistan in water and its efficient use in the region is great and deserves support.

Source: National Information Agency of Tajikistan «Khovar»

MINUTES OF THE 68TH MEETING OF THE INTERSTATE COMMISSION FOR WATER COORDINATION (ICWC) OF THE REPUBLIC OF KAZAKHSTAN, KYRGYZ REPUBLIC, REPUBLIC OF TAJIKISTAN, TURKMENISTAN AND REPUBLIC OF UZBEKISTAN

May 20, 2016 Almaty, Republic of Kazakhstan

Chairman:

Abishev Islam Almakhanovich	Chairman of the Committee on Water Resources of the Ministry of Agriculture, Republic of Kazakhstan

ICWC members:

Rakhimzoda Sulton Nurmakhmadpur	First Deputy Minister of Energy and Water Resources, Republic of Tajikistan (MEWR RT)
Baydjanov Guyzgeldy	Deputy Minister of Agriculture and Water Resources, Turkmenistan
Fozilov Allamjon Karimovich	Deputy Head of Central Water Resources Administration, Ministry of Agriculture and Water Resources of the Republic of Uzbekistan (MAWR RUz)

ICWC executive bodies:

Dukhovniy Viktor Abramovich	Director of SIC ICWC
Babadjanova Malika Pulatovna	Head of ICWC Secretariat
Kholkhuzhaev Odil Akhmedovich	Acting Head of BWO Syrdarya
Makhramov Makhmud Yakhshibaevich	Acting Head of BWO Amudarya

Invited:

Utembayev Yerik Myltykbayevich	Ambassador of Extraordinary and Plenipotentiary of the Republic of Kazakhstan to the Republic of Uzbekistan
Kojaniyazov Serik Salavatovich	Deputy akim (head) of Kyzylorda province
Karlykhanov Adilkhan Karlykhanovich	Head of the Aral-Syrdarya Basin Inspection on regulation of use and protection of water resources, Ministry of Agriculture of the Republic of Kazakhstan
Zhienbaev Musilim Rysmakhanovich	Head of Transboundary rivers Division of Water and Biological Resources Department, Ministry of Agriculture of the Republic of Kazakhstan
Bekmaganbetov Serik Abdrakhmanovich	Advisor to Pan-Asian Cooperation Department, Ministry of Foreign Affairs, Republic of Kazakhstan
Karbozin Kaysar Kayratovich	First Secretary of Pan-Asian Cooperation Department, Ministry of Foreign Affairs, Republic of Kazakhstan
Kipshakbaev Nariman Kipshakbaevich	Director of Kazakh branch of SIC ICWC
Kenshimov Amirkhan Kadyrbekovich	Deputy Director, Executive Direction of IFAS in the Republic of Kazakhstan
Bekjanov Yerkebulan Maratovich	Head of Department of Natural Resources and Environmental Management of Kyzylorda province
Turebekov Serik Ordabekovich	Head of Department of Agriculture of South-Kazakhstan province
Egenov Meyrbek Duysenbekovich	Director, South-Kazakhstan branch of the RSE “Kazvodkhoz” of the Committee for Water Resources, Ministry of Agriculture of the Republic of Kazakhstan
Arystanbayev Bolat Sabyrovich	Director, Kyzylorda branch of the RSE “Kazvodkhoz” of the Committee for Water Resources, Ministry of Agriculture of the Republic of Kazakhstan

Arystanov Meyram Buranovich	Expert of Transboundary rivers Division of the Ministry of Agriculture, Republic of Kazakhstan
Lyu Marina Zeysinovna	Leading specialist, RSE "KazHydromet"
Ryspekov Nasipay Melsovich	Consul of the Consulate General of the Kyrgyz Republic in Almaty, Republic of Kazakhstan
Gaforzoda Bakhrom Abdulafiz	Deputy Director of Land Reclamation and Irrigation Agency under the Government of the Republic of Tajikistan
Kholmatov Daler Abdukhalokovich	Leading specialist of Main Department of Water-Energy Policy, Ministry of Energy and Water Resources of the Republic of Tajikistan
Paschyev Yanov Durdyevich	Head of Department of Water Use, Ministry of Agriculture and Water Resources of Turkmenistan
Kuchkarov Sharifzhon Zikrillaevich	Head of Water Balance and Advanced Water Saving Technologies Division, MAWR of the Republic of Uzbekistan
Beglov Iskander Ferdinandovich	Head of Division, SIC ICWC
Nazariy Laziz Alisherocivh	Leading hydraulic engineer, BWO Syrdarya
Nikolaenko Aleksandr Yurevich	Regional Adviser, German Society for International Cooperation (GIZ), Transboundary Water Resources Management Program in Central Asia (TWRMP CA)

Agenda of the 68th ICWC Meeting

1. The results of the non-growing season 2015-2016 in the Amudarya and Syrdarya River Basins;

2. Consideration and approval of the water withdrawal quotas and operation

regimes of reservoir cascade for the next growing season 2016 in the Amudarya and Syrdarya River Basins;

3. Presentation and discussion of the proposals and comments received in the course of interdepartmental approval at the national level of the draft Agreement between the Republic of Kazakhstan, the Kyrgyz Republic, the Republic of Tajikistan, Turkmenistan, and the Republic of Uzbekistan on the Information and Analytical Support of Water Management, Use, and Protection in the Aral Sea Basin and the Arrangement of Interstate Exchange of Information and their consideration;

4. Consideration of the progress achieved by the Working Group under the GIZ Project "Modern hydrometric monitoring (of the interstate canals) in the Syrdarya River Basin".

Supplementary item:

1. Agenda and venue of the next 69th ICWC meeting.

Decisions on the first item:

1. Take note of the information of BWO Amudarya and BWO Syrdarya about the results of the non-growing season 2015-2016 in the Amudarya and Syrdarya River Basins;
2. Assign BWO Amudarya to carry out a thorough analysis of substantial water losses along the reaches of the Amudarya River and submit the repot at the next ICWC Meeting. BWO Amudarya should tighten control over accounting of water resources in the Amudarya River Basin.
3. Take note of the information that one-time above-quota water withdrawal was made from the Syrdarya River by the Republic Uzbekistan and Republic of Kazakhstan during the non-growing season 2015-2016.
4. In the future, all parties should avoid uncoordinated over-use of the established water quotas for the Syrdarya River Basin.

Decisions on the second item:

1. Approve water withdrawal quotas of the countries and forecast operation regime of the reservoir cascade for the growing season 2016 in the Amudarya River basin (Annex 1).

2. Take note of the water withdrawals quotas of the countries and forecast operation regime of the reservoir cascades for the growing season 2016 in the Syrdarya River basin (Annex 2), taking into account the operation regime of Bakhri Tochik reservoir proposed by the Tajik party (Annex 3).

3. Coordinate, on a routine basis, with Kyrgyz party the proposed country water withdrawal quotas and forecast operation regime of the reservoir cascades for the growing season 2016 (Annex 2) in the Syrdarya River basin.

4. The Republic of Kazakhstan and the Republic of Uzbekistan will distribute actual stream flow in the head structure of the Dostyk canal on an equitable basis (50/50). The parties will make all efforts to ensure the fulfillment of forecast operation regime of the reservoir cascade.

Decision on the third item:

1. Take note of the information of the Parties about the results of interdepartmental approval at the national level of the draft Agreement between the Republic of Kazakhstan, the Kyrgyz Republic, the Republic of Tajikistan, Turkmenistan, and the Republic of Uzbekistan on the Information and Analytical Support of Water Management, Use, and Protection in the Aral Sea Basin and the Arrangement of Interstate Exchange of Information.

Decisions on the fourth item:

1. Take note of the information on work progress of the Working Group under GIZ Project "Modern hydrometric monitoring (on the interstate canals) in the Syrdarya River Basin".

2. Charge BWO Syrdarya, with the support of GIZ Project, to organize a meeting of the Working Group on the joint hydrological monitoring in the Syrdarya River Basin.

3. BWO Syrdarya should consider a possibility of making available information on gauging stations to all ICWC members.

Decision on the supplementary item:

1. Approve agenda, date and venue of the 69th ICWC meeting in working order.

Republic of Kazakhstan	**I.A.Abishev**
Kyrgyz Republic	**K.J.Tashtanaliev**
Republic of Tajikistan	**S.N.Rakhimzoda**
Turkmenistan	**G.Baydjanov**
Republic of Uzbekistan	**A.K.Fozilov**

Annex 1

Quotas of water withdrawal from the Amudarya River and water supply to Prearalie and the Aral Sea for the growing season 2016

NN	River basin, state	Water withdrawal quotas, Mm^3	
		total annual (1.10.15 to 1.10 .16)	including growing season (1.04.16 to 1.10.16)
	Total withdrawal from the Amudarya River	55,424	39,696
	of which:		
1	Republic of Tajikistan	9,854	6,976
2	From the Amudarya River to Atamurat gauging station	44,000	31,520
3	Turkmenistan	22,000	15,500
4	Republic of Uzbekistan	22,000	16,020
	Additionally:		
5	Surkhandarya province	1,570	1,200
6	Plus: - water supply to Prearalie, including irrigation water and CDW	4,200	2,100
7	- sanitary and environmental water releases to irrigation systems in:	0.800	
	Dashoguz province	0.150	
	Khorezm province	0.150	
	Republic of Karakalpakstan	0.500	
	Total to the Aral Sea	5,000	2,100

Note: Water withdrawal quotas imply water supply for irrigation, industrial, municipal and other needs. If water availability in the basin changes, the quotas will be adjusted accordingly.

Annex 2

FORECAST OPERATION SCHEDULE
of the Naryn-Syrdarya reservoir cascade with additional releases from the upper reservoirs to overcome water deficit from April 1, 2016 to September 30, 2016
(Hydromet's forecast - 88%, quotas - 100%)

		April forecast	**April** actual	**May**	**June**	**July**	**August**	**September**	**Total, Mm3**
Toktogul reservoir									
Inflow to reservoir	m3/s	265,29	322,73	553,30	840,08	751,65	530,58	274,13	
	Mm3	687,63	836,52	1481,96	2177,49	2013,22	1421,11	710,54	8640,84
Volume: beginning of the period	Mm3	8934,00	**8934,00**	**9110,00**	**9972,09**	**11316,87**	**12012,11**	**12631,28**	
end of the period	Mm3	8970,55	**9110,00**	**9972,09**	**11316,87**	**12012,11**	**12631,28**	**12883,30**	
Water releases from reservoir	m3/s	250,00	268,10	206,57	320,00	488,00	293,39	170,00	
	Mm3	648,00	694,92	553,29	829,44	1307,06	785,81	440,64	4611,15
Bakhri Tochik reservoir*									
Inflow to reservoir	m3/s	351,74	445,27	525,23	295,97	312,68	180,49	217,52	
	Mm3	911,71	1154,13	1406,77	767,16	837,48	483,43	563,82	5212,80
Volume: beginning of the period	Mm3	3379,90	**3379,90**	**3482,10**	**3494,77**	**3070,16**	**2390,78**	**1665,41**	
end of the period	Mm3	3406,68	**3482,10**	**3494,77**	**3070,16**	**2390,78**	**1665,41**	**1717,86**	
Water releases from reservoir	m3/s	340,00	361,54	478,94	400,00	500,00	396,77	166,67	
	Mm3	881,28	937,10	1282,79	1036,80	1339,20	1062,72	432,00	6090,61
Shardara reservoir									
Inflow to reservoir	m3/s	291,51	609,60	411,30	197,99	169,26	133,72	205,46	
	Mm3	755,59	1580,07	1101,62	513,19	453,35	358,14	532,54	4538,92
Volume: beginning of the period	Mm3	4850,00	**4850,00**	**4919,00**	**4957,99**	**4141,48**	**2934,23**	**1926,39**	

		April forecast	April actual	May	June	July	August	September	Total, Mm3
end of the period	Mm3	4737,27	**4919,00**	**4957,99**	**4141,48**	**2934,23**	**1926,39**	**2090,87**	
Water releases from reservoir	m3/s	300,00	427,67	249,03	350,00	450,00	400,00	100,00	
	Mm3	777,60	1108,51	667,01	907,20	1205,28	1071,36	259,20	5218,56
Release to the Kyzylkum canal	m3/s	20,00	51,00	77,42	110,00	110,00	90,00	25,00	
	Mm3	51,84	132,19	207,36	285,12	294,62	241,06	64,80	1225,15
Release to the Arnasay depression	m3/s	0,00	0,00	0,00	0,00	0,00	0,00	0,00	
	Mm3	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
Supply to the Aral Sea	m3/s	117,50	26,77	72,45	98,70	120,70	126,30	149,70	
	Mm3	304,56	69,38	194,05	255,83	323,28	338,28	388,02	1568,84
Charvak reservoir									
Inflow to reservoir	m3/s	231,87	283,48	456,84	528,67	391,65	220,00	130,00	
(4 rivers in total)	Mm3	268,28	734,77	1223,61	1370,30	1048,98	589,25	336,96	5303,87
Volume: beginning of the period	Mm3	791,00	**791,00**	**1139,00**	**1632,32**	**2010,00**	**1980,91**	**1809,34**	
end of the period	Mm3	976,77	**1139,00**	**1632,32**	**2010,00**	**1980,91**	**1809,34**	**1659,09**	
Water releases from reservoir	m3/s	160,00	152,83	264,84	381,76	400,90	282,26	186,67	
(Release from the Gazalkent HPP)	Mm3	1111,94	396,14	709,34	989,51	1073,78	756,00	483,84	4408,62
Andizhan reservoir									
Inflow to reservoir	m3/s	136,80	96,83	305,48	276,67	132,58	82,90	48,33	
	Mm3	354,59	250,99	818,21	717,12	355,10	222,05	125,28	2488,75
Volume: beginning of the period	Mm3	1013,47	**1013,47**	**1023,46**	**1501,15**	**1663,51**	**1511,74**	**1394,10**	
end of the period	Mm3	1107,92	**1023,46**	**1501,15**	**1663,51**	**1511,74**	**1394,10**	**1343,93**	
Water releases from reservoir	m3/s	100,00	92,05	126,77	213,67	188,23	125,81	66,67	
	Mm3	259,20	238,58	339,55	553,82	504,14	336,96	172,80	2145,86

* Operation regime of the Bakhri Tochik reservoir should be in line with Annex 3.

Annex 3

Operation schedule of the Bakhri Tochik reservoir for the growing season 2016

Month	June			July			August		
Ten-day	1	2	3	1	2	3	1	2	3
Difference between inflow to and water releases from the reservoir	0.00	-50.00	-130	-180	-200	-190	-170	-130	-115
Average for a month	-60			-190			-138.3		
Average for a season	-129.4								

THE RESULTS OF THE NON-GROWING SEASON 2015-2016 IN THE AMUDARYA AND SYRDARYA RIVER BASINS[1]

Amudarya River basin

The actual water availability at the Atamurat gauging station upstream of Garagumdarya during the non-growing season 2015-2016 was 88.9 % of the norm. Given the norm 14,624 Mm3, the actual value was 12,995 Mm3. In the past season, the water availability was 99.0 %.

The use of approved quotas of water withdrawal during the non-growing season under review, with a breakdown into the Central Asian states is as follows:

Totally in the basin, 96.4% of the approved water withdrawal quota was used, and the quota was 15,727.6 Mm3, the actually used volume was 15,167.6 Mm3, including:

Republic of Tajikistan actually used 2,493.1 Mm3, while the quota was 2,877.6 Mm3 (86.6% of the quota);

Republic of Uzbekistan actually used 6,355.2 Mm3, while the quota was 6,350 Mm3 (100.1% of the quota);

Turkmenistan actually used 6,319.3 Mm3, while the quota was 6,500 Mm3 (97.2% of the quota).

Water user state	Quota Mm^3	Actual Mm^3	%%
Republic of Tajikistan	2,877.6	2,493.1	86.6
Turkmenistan	6,500.0	6,319.3	97.2
Republic of Uzbekistan	6,350.0	6,355.2	100.1
Total	**15,727.6**	**15,167.6**	**96.4**

The use of water withdrawal quotas downstream of the Atamurat gauging station, which is upstream of Garagumdarya, amounted to 98.6%, including:

Republic of Uzbekistan actually used 5,987.6 Mm3 (100.1% of the quota)

Turkmenistan actually used 6,319.3 Mm3 (97.2% of the quota)

[1] Information on the first item of agenda of the 68th ICWC meeting

River reach Water user state	Quota Mm^3	Actual Mm^3	%%
Downstream of the Atamurat gauging station	12,480.0	12,306.9	98.6
Turkmenistan	6,500.0	6,319.3	97.2
Republic of Uzbekistan	5,980.0	5,987.6	100.1

The actual use of the approved water withdrawal quotas broken down into river reaches is as follows:

1. Upper reaches – 88.1 %, of which 86.6 % - Republic of Tajikistan; 99.35% - Republic of Uzbekistan.

2. Middle reaches– 98.0 5%, of which 101.6 % - Republic of Uzbekistan; 95.8 % - Turkmenistan.

3. Lower reaches– 99.75 %, of which 98.3 % - Republic of Uzbekistan; 102.5 % -Turkmenistan.

River reach Water user state	Quota Mm^3	Actual Mm^3	%%
Upper reaches	**3,247.6**	**2,860.7**	**88.1**
Republic of Tajikistan	2,877.6	2,493.1	86.6
Republic of Uzbekistan	370.0	367.6	99.35
Middle reaches	**8,345.0**	**8,182.3**	**98.05**
Turkmenistan	5,100.0	4,884.3	95.8
Republic of Uzbekistan	3,245.0	3,298.0	101.6
Lower reaches	**4,135.0**	**4,124.6**	**99.75**
Turkmenistan	1,400.0	1,435.0	102.5
Republic of Uzbekistan	2,735.0	2,689.6	98.3

Prearalie and the Aral Sea were to receive 2,100 Mm3, whereas, in fact, received 3,297 Mm3 or 157.0% during non-growing season.

The inflow to the Nurek reservoir during non-growing season was to be 3,584 Mm3 while, in fact, it was 3,857 Mm3. It was planned to release 7,895 Mm3, while actually 7,641 Mm3 were released. By the end of the non-growing season 2015-2016, the water volume in the reservoir was to be 6,209 Mm3, while actually it was 6,744 Mm3.

The inflow to the Tuyamuyun reservoir during the non-growing season was planned to be 7,059 Mm3, while, in fact, it was 6,449 Mm3. It was planned to release 8,439 Mm3 from the reservoir, and actually 8,551 Mm3 were released.

By the end of non-growing season 2015-2016, the amount of water in the reservoir was to be 4,145 Mm3. The actual water volume was 3,331 Mm3.

Parameter		**Unit**	**Nurek reservoir**	**Tuyamuyun reservoir**
Volume: beginning of the period		Mm^3	10,500	5,433
Inflow to the reservoir	forecast	Mm^3	3,584	7,059
	actual	Mm^3	3,857	6,449
		%%	107.6	91.4
Release from the reservoir	forecast	Mm^3	7,895	8,439
	actual	Mm^3	7,641	8,551
		%%	96.9	101.3
Volume: end of the period	forecast	Mm^3	6,209	4,145
	actual	Mm^3	6,744	3,331
		%%	108.6	80.4
Accumulation (+), drawdown(-)	forecast	Mm^3	-4,311	-1,379
	actual	Mm^3	-3,756	-2,102
		%%	87.1	178.1

It should be noted that water releases from the Nurek reservoir were 96.9% out of the planned one, whereas the inflow to the reservoir was 107.6 % out of the forecast one.

More detailed information is given in the Tables below.

Analysis of the use of water withdrawal quotas during the non-growing season 2015-2016 in the Amudarya River basin

Name	Water quotas for the non-growing season 2015-2016 Mm^3	Actual Mm^3	%%
Upper-Amudarya Administration	**3,247.6**	**2,860.7**	**88.1**
(Upper reaches)			
Of which:			
Tajikistan	2,877.6	2,493.1	86.6
Uzbekistan	370	367.6	99.4
Water withdrawals from the Amudarya River			
at the Atamurat gauging station (Kerki)	**12,480**	**12,306.9**	**98.6**
Of which:			
Turkmenistan	6,500.0	6,319.3	97.2
Uzbekistan	5,980.0	5,987.6	100.1
Middle-Amudarya Administration	**8,345**	**8,182.3**	**98.1**
(Middle reaches), of which:			
Turkmenistan	5,100	4,884.3	95.8
Uzbekistan	3,245	3,298	101.6
Lower reaches:	**4,135**	**4,124.6**	**99.7**
Of which:			
Turkmenistan	**1,400.0**	**1,435.0**	**102.5**
Uzbekistan	**2,735.0**	**2,689.6**	**98.3**
Besides, sanitary water releases, total	800	799.7	100.0
of which: Karakalpakstan	500	500	100,0
Dashoguz province	150	149.8	99.9
Khorezm province	150	149.9	99.9
Total for the basin:	15,727.6	15,167.6	96.4
Of which			
Republic of Tajikistan	2,877.6	2,493.1	86.6
Turkmenistan	6,500.0	6,319.3	97.2
Uzbekistan	6,350.0	6,355.2	100.1

Actual hydrological situation in the Amudarya River for the non-growing season 2015-2016

Parameters	Unit	October	November	December	January	February	March	Total
		Actual						Mm3
Inflow to the Nurek reservoir	m3/s	**355**	**291**	**215**	**205**	**172**	**222**	3,857
Nurek reservoir capacity	Mm3	**10,464**	**10,075**	**9,354**	**8,515**	**7,556**	**6,744**	
Offtake from Nurek	m3/s	**385**	**444**	**482**	**519**	**555**	**521**	7,641
Atamurat GS actual	**m3/s**	**650**	**750**	**717**	**714**	**698**	**621**	10,927
norm	m3/s	880	760	870	876	833	823	13,295
%%	%	73.8	98.7	82.4	81.5	83.8	75.4	82.2
Upstream of Garagumdarya (actual water availability)	m3/s	**1,081**	**947**	**746**	**710**	**691**	**751**	12,995
Norm	m3/s	1,133	952	896	813	796	952	14,624
%	%	95.4	99.5	83.3	87.3	86.8	78.9	88.9
Cumulative, actual	Mm3	2,895	5,351	7,350	9,252	10,985	12,996	12,996
Norm	Mm3	3,034	5,503	7,902	10,080	12,006	14,624	14,624
%	%	88.4	88.4	88.4	88.4	88.4	88.4	88.4
Surkhandarya province	m3/s	**43**	**25**	**11**	**24**	**26**	**11**	368
Water intakes upstream of the Atamurat GS	m3/s	**403**	**321**	**288**	**286**	**350**	**422**	5,457
Water inflow in the Kelif GS	m3/s	**1,052**	**1,072**	**1,004**	**1,000**	**1,048**	**1,042**	16,384
Water intakes in Kelif-Birata	m3/s	**587**	**479**	**415**	**448**	**554**	**629**	8,197
Return water in Kelif-Birata	m3/s	**89**	**76**	**57**	**74**	**112**	**111**	1,364
Water losses in Kelif-Birata	m3/s	**-26**	**27**	**97**	**101**	**59**	**95**	935
Inflow to the Birata GS – actual	m3/s	**580**	**642**	**548**	**525**	**548**	**430**	8,615
Norm	m3/s	**685**	665	729	616	492	546	9,855
Cumulative, actual	Mm3	1,554	3,219	4,687	6,093	7,465	8,615	8,615
Norm	Mm3	1,835	3,558	5,510	7,160	8,393	9,855	9,855

Parameters	Unit	October	November	December	January	February	March	Total
		Actual						Mm3
%	%	84.7	90.5	85.1	85.1	88.9	87.4	70.1
Water losses in Birata-Tuyamuyun	m3/s	**132**	**113**	**94**	**112**	**168**	**203**	2,166
Tuyamuyun reservoir capacity; Beginning of the period	Mm3	**5,433**	**5,403**	**5,679**	**5,331**	**5,450**	**4,872**	
Inflow to the Tuyamuyun reservoir	m3/s	**448**	**530**	**454**	**413**	**379**	**226**	6,449
Offtake from the Tuyamuyun reservoir	m3/s	**459**	**424**	**584**	**368**	**610**	**802**	8,551
Tuyamuyun reservoir capacity; End of the period	Mm3	**5,403**	**5,679**	**5,331**	**5,450**	**4,872**	**3,331**	
Accumulation (+), drawdown (-)	Mm3	-30	276	-348	119	-578	-1,541	-2,102
Water withdrawals from the Tuyamuyun reservoir	m3/s	**130**	**23**	**91**	**51**	**188**	**341**	2,172
Water withdrawals in Tuyamuyun-Samanbay	m3/s	**186**	**57**	**138**	**109**	**243**	**312**	2,751
Water losses in Tuyamuyun-Samanbay	m3/s	**43**	**122**	**45**	**57**	**99**	**98**	1,219
Water releases from Takhiatash	m3/s	**101**	**221**	**309**	**151**	**79**	**51**	2,409
Water withdrawals in Kelif-Samanbay	m3/s	902	559	645	607	985	1,282	13,119

Information on water supply to Prearalie and the Aral Sea for the non-growing season 2015-2016

Mm^3

Name	X	XI	XII	I	II	III	Water supply from 01.10.15 to 31.03.16 Actual
From the Amudarya River, at the Samanbay GS	262	500	734	316	183	141	2,136
Total water discharge from system Dostlyk and Suenli canals	116	75	40	41	0	1	273
CDF	81	66	108	107	194	332	888
Total:	459	641	882	464	377	474	3,297
Cumulative	459	1,100	1,982	2,446	2,823	3,297	

Note: Data on water supply to Peiaralie are agreed with the State Hydro meteorological Service (Hydromet) of the Republic of Uzbekistan

Actual operation regime of the Nurek reservoir (from October 2015 to March 2016)

	Unit	Actual						Total
		X	XI	XII	I	II	III	
Volume: Beginning of the period	Mm3	10,500	10,464	10,075	9,354	8,515	7,556	10,500
Inflow to the reservoir	m3/s	355	291	215	205	172	222	
	Mm3	951	753	577	549	431	594	3,857
Release from the reservoir	m3/s	385	444	482	519	555	521	
	Mm3	1,032	1,150	1,290	1,389	1,390	1,396	7,641
Volume: End of the period	Mm3	10,464	10,075	9,354	8,515	7,556	6,744	6,744
Accumulation (+), drawdown (-)	Mm3	-36	-389	-721	-839	-959	-812	-3,756

Actual operation regime of the Tuyamuyun reservoir (from October 2015 to March 2016)

	Unit	Actual						Total
		X	XI	XII	I	II	III	
Volume: Beginning of the period	Mm 3	5,433	5,403	5,679	5,331	5,450	4,872	5,433
Inflow to the reservoir	m3/s	440	532	456	413	385	225	
	Mm 3	1,179	1,379	1,221	1,106	966	602	6,449
Release from the reservoir	m3/s	460	420	580	354	606	804	
	Mm 3	1,233	1,090	1,554	948	1,518	2,153	8,551
Volume: End of the period	Mm 3	5,403	5,679	5,331	5,450	4,872	3,331	3,331
Accumulation (+), drawdown (-)	Mm 3	-30	276	-348	119	-578	-1,541	-2,102

Syrdarya River basin

According to the Hydromet's forecast for the non-growing season 2015-2016 received on September 25, 2015 and the forecast for the 4th quarter, the inflow to the Toktogul reservoir was expected to be 100%, to the Andizhan reservoir – 102%, and to the Charvak reservoir – 101% of the norm; the total lateral inflow was to be 98% of the norm.

The normal inflow to upper reservoirs in the Naryn-Syrdarya cascade is 5,138 Mm³ for the non-growing season. According to the Hydromet's forecast, the inflow was expected to be 5,174 Mm³ (101% of the norm). The actual inflow to the upper reservoirs was 6,250 Mm^3 (121% of the forecast) that was 1,076 Mm³ more than the forecast (Table 2.1).

The normal lateral inflow to the section of the Syrdarya River to the Shardara reservoir is 11 billion 61 million m³. By the Hydtomet's forecast, the lateral inflow was expected to be 10,831 Mm^3 (98 % of the norm). It actually amounted to 12,276 Mm^3 (113 % of the norm), which was 1,445 Mm³ more than the forecast.

The total normal inflow in the basin is 16,199 Mm³ during the non-growing season. According to the Hydromet's forecast, the total lateral inflow was expected to

be 16,005 Mm^3 (99 % of the norm). It actually was 18,526 Mm^3 (116% of the forecast) that was 2,521 Mm^3 more than the forecast.

During the non-growing season 2015-2016, the total lateral inflow was 16,066 Mm^3.

Table 2.1

Parameters	Volume, Mm^3 01.10.15 to 01.04.16			actual/ forecast (%)	actual/ norm (%)	Actual 1.10.2014 to 1.04.2015
	norm	forecast	actual			
Inflows to upper reservoirs						
Toktogul	2,798	2,798	3,381	121	121	2,890
Andizhan	929	950	909	96	98	1,101
Charvak (4 rivers in total)	1,411	1,426	1,960	137	139	1,619
Total:	**5,138**	**5,174**	**6,250**	**121**	**122**	**5,610**
Lateral inflows						
Toktogul – Uchkurgan	400	400	559	140	140	257
Uchkurgan, Uchtepe – Bakhri Tochik	4,265	4,265	5,301	124	124	4,507
Andizhan – Uchtepe	2,562	2,689	2,669	99	104	2,337
Bakhri Tochik – Shardara	2,971	2,687	2,453	91	83	2,668
Gazalkent – Chinaz (excluding Ugam)	863	790	1,294	164	150	687
Overall:	**11,061**	**10,831**	**12,276**	**113**	**111**	**10,456**
Total:	**16,199**	**16,005**	**18,526**	**116**	**114**	**16,066**

In the operation schedule of the Naryn-Syrdarya reservoir cascade for the non-growing season, 6,552 Mm^3 was planned to be released form the Tokrogul reservoir. The actual release was 7,442 Mm^3 that was 890 Mm^3 more than the scheduled amount.

Scheduled water releases from the Andizhan reservoir were 517 Mm^3. The actual release was 667 Mm^3 that was 150 Mm^3 more than the scheduled amount.

Scheduled water releases from the Charvak reservoir were 2,134 Mm^3. The actual release was 2,702 Mm^3 that was 568 Mm^3 more than the scheduled amount.

Scheduled water releases from the Bakhri Tochik reservoir were 9,393 Mm^3. The actual release was 9,801 Mm^3 that was 408 Mm^3 more than the scheduled amount.

Scheduled water releases from the Shardara reservoir were 8,156 Mm³. The actual releases were 7,196 Mm³ , i.e. 960 Mm³ less than the scheduled amount.

Finally, the scheduled total water releases from the reservoirs were to be 26,752 Mm³. The actual releases were 27,808 Mm³ , i.e. 1,056 Mm³ more than the scheduled amount (Table 2.2).

During the non-growing season 2015-2016, 29,453 Mm³ were released from the reservoirs.

Table 2.2

Reservoir	Water releases, Mm³ 01.10.15 to 01.04.16		actual/ schedule (%)	Water releases, Mm³ 01.10.14 to 01.04.15
	as of the schedule	actual		
Toktogul	6,552	7,442	114	8,400
Andizhan	517	667	129	523
Charvak (release from the Gazalkent HPP)	2,134	2,702	127	2,454
Total:	**9,203**	**10,811**	**117**	**11,377**
Bakhri Tochik	9,393	9,801	104	9,759
Shardara	8,156	7,196	88	8,317
Overall:	**17,549**	**16,997**	**97**	**18,076**
Total:	**26,752**	**27,808**	**104**	**29,453**

Water was supplied to states during the non-growing season, taking into account water user requests in the following amounts (Tables 2.3 and 2.4):

- Kazakhstan 492 Mm^3 (120% of the quota);
- Kyrgyzstan 27 Mm^3 (72%);
- Tajikistan 16 Mm^3 (4%);
- Uzbekistan 3,082 Mm^3 (124%).

Table 2.3

Water user state	Water withdrawals, Mm³ (from 01.10.15 to 01.04.16)		
	Quota	Actual	%
Republic of Kazakhstan (Dostyk canal)	410	492	120
Kyrgyz Republic	37	27	72
Republic of Tajikistan	368	16	4
Republic of Uzbekistan	2,483	3,082	124

Table 2.4

Reach, Water user state	Water withdrawals, Mm³ (from 01.10.15 to 01.04.16)		
	Quota	Actual	%%
Toktogul – Uchkurgan hydroscheme, of which:	**13,66.72**	**1,485.43**	**109**
Kyrgyzstan	29.76	23.65	79
Tajikistan	85.00	3.28	4
Uzbekistan	1,251.96	1,458.51	116
Uchkurgan – Bakhri Tochik hydroscheme, of which:	**246.70**	**228.67**	**93**
Kyrgyzstan	7.13	2.95	41
Tajikistan	68.59	2.10	3
Uzbekistan	170.98	223.62	131
Bakhri Tochik hydroscheme – Shardara reservoir, of which:	**1,684.77**	**1,902.88**	**113**
Kazakhstan	409.97	491.62	120
Tajikistan	214.28	11.07	5
Uzbekistan	1,060.52	1.400.20	132

The scheduled inflow to the Shardara reservoir was 12, 422 billion m³. The actual inflow to the reservoir was 11,30 billion m³.

The inflow to the Aral Sea and Prearalie was expected to be 1,906 Mm³. The actual inflow was 3,353 Mm³ at the Karateren gauging station (Table 2.5).

The inflow to the Shardara reservoir was 11,480 Mm³ during the non-growing season 2015-2016.

Table 2.5

Parameters	Scheduled	actual	Actual for the non-growing season 2015-2016
	Mm³		
Inflow to the Shardara reservoir	12,422	11,030	11,480
Discharge into Arnasay system	0	0	344
Supply to the Aral Sea	1,906	3,353	2,323

By the end of the non-growing season by April 1, the amount of water in the upstream reservoirs was 10,738 Mm³, which was 602 Mm³ less than the plan of 11,340 Mm³ (Table 2.6).

Water accumulation in the upstream reservoirs was as follows:

In Toktogul 8,934 Mm³,

In Andizhan 1,013 Mm³,

In Charvak 791 Mm³.

Table 2.6

Reservoir	Reservoir volume, Mm³			
	As of 01.10.15	scheduled as of 01.04.16	Actual as of 01.04.16	Actual as of 01.04.15.
Toktogul	13,010	9,244	8,934	6,405
Andizhan	791	1,221	1,013	953
Charvak	1,593	875	791	588
Total:	**15,394**	**11,340**	**10,738**	**7,946**
Bakhri Tochik	1,749	3,418	3,380	3,478
Shardara	1,218	5,311	4,850	3,910
Overall:	**2,967**	**8,729**	**8,230**	**7,388**
TOTAL:	**18,361**	**20,069**	**18,968**	**15,334**

Operation schedule of the Naryn-Syrdarya reservoir cascade from October 1, 2015 to April 1, 2016 is given in Table 2.7.

Table 2.7

OPERATION SCHEDULE
of the Naryn-Syrdarya reservoir cascade
from October 1,2015 to March 31, 2016

Toktogul reservoir		*October (actual)*	*November (actual)*	*December (actual)*	*January (actual)*	*February (actual)*	*March (actual)*	*Total Mm3*
Inflow to the reservoir	*m3/s*	***257.55***	***228.93***	***199.74***	***179.94***	***177.14***	***237.77***	
	Mm3	689.82	593.40	534.99	481.94	443.84	636.85	3,380.84
Volume:beginning of the peri	*Mm3*	***13,010.00***	***12,854.00***	***12,189.00***	***11,196.00***	***10,145.00***	***9,228.00***	
End of the period	*Mm3*	***12,854.00***	***12,189.00***	***11,196.00***	***10,145.00***	***9,228.00***	***8,934.00***	
Release from the reservoir	*m3/s*	***313.84***	***483.50***	***566.45***	***574.74***	***546.59***	***344.35***	
	Mm3	840.59	1,253.23	1,517.19	1,539.39	1,369.53	922.32	7,442.24
Kairakkum reservoir								
Inflow to the reservoir	*m3/s*	***520.61***	***916.23***	***916.00***	***839.84***	***805.86***	***505.26***	
	Mm3	1,394.41	2,374.88	2,453.41	2,249.43	2,019.17	1,353.28	11,844.58
Volume:beginning of the peri	*Mm3*	***1,748.50***	***2,505.90***	***2,776.00***	***2,501.00***	***2,457.90***	***2,741.70***	
End of the period	*Mm3*	***2,505.90***	***2,776.00***	***2,501.00***	***2,457.90***	***2,741.70***	***3,379.90***	
Release from the reservoir	*m3/s*	***198.13***	***815.93***	***964.32***	***804.55***	***651.90***	***292.81***	
	Mm3	530.67	2,114.90	2,582.84	2,,154.90	1,633.39	784.25	9,800.95
Shardara reservoir								
Inflow to the reservoir	*m3/s*	***252.00***	***959.99***	***1,009.54***	***771.90***	***827.41***	***381.57***	
	Mm3	674.95	2,488.30	2,703.95	2,067.45	2,073.15	1,021.99	11,029.80
Volume:beginning of the peri	*Mm3*	***1,218.00***	***1,503.00***	***2,078.00***	***3,084.00***	***3,808.00***	***4,538.00***	
End of the period	*Mm3*	***1,503.00***	***2,078.00***	***3,084.00***	***3,808.00***	***4,538.00***	***4,850.00***	
Release from the reservoir	*m3/s*	***174.52***	***720.33***	***669.68***	***566.61***	***463.10***	***145.48***	
	Mm3	467.42	1,867.10	1,793.66	1,517.62	1,160.35	389.67	7,195.83
Release to the Kzylkum can	*m3/s*	***5.00***	***5.00***	***5.00***	***5.00***	***5.00***	***55.64***	
	Mm3	13.39	12.96	13.39	13.39	12.53	149.04	214.70
Release to the Arnasay	*m3/s*	***0.00***	***0.00***	***0.00***	***0.00***	***0.00***	***0.00***	
depression	*Mm3*	0.00	0.00	0.00	0.00	0.00	0.00	0.0
Supply to the Aral Sea	*m3/s*	50.46	132.12	297.93	357.49	264.62	170.42	
	Mm3	135.15	342.45	797.96	957.49	663.04	456.45	3,352.54
Charvak reservoir								
Inflow to the reservoir	*m3/s*	***116.44***	***129.14***	***123.23***	***102.53***	***95.42***	***175.26***	
(4 rivers in total)	*Mm3*	311.87	334.73	330.07	274.62	239.10	469.43	1,959.82
Volume:beginning of the peri	*Mm3*	***1,593.00***	***1,456.00***	***1,378.00***	***1,158.00***	***890.00***	***757.00***	
End of the period	*Mm3*	***1,456.00***	***1,378.00***	***1,158.00***	***890.00***	***757.00***	***791.00***	
Release from the reservoir	*m3/s*	***168.55***	***166.23***	***190.26***	***193.71***	***138.17***	***166.03***	
(Release from the Gazalkent HPP)	*Mm3*	451.44	430.88	509.59	518.84	346.20	444.70	2,701.65
Andizhan reservoir								
Inflow to the reservoir	*m3/s*	***42.61***	***76.13***	***64.26***	***50.03***	***50.55***	***61.61***	
	Mm3	114.13	197.34	172.11	134.01	126.66	165.02	909.27
Volume:beginning of the peri	*Mm3*	***790.70***	***669.51***	***747.10***	***869.38***	***949.80***	***1,020.13***	
End of the period	*Mm3*	***669.51***	***747.10***	***869.38***	***949.80***	***1,020.13***	***1,013.47***	
Release from the reservoir	*m3/s*	***86.29***	***45.24***	***17.07***	***20.11***	***20.41***	***62.64***	
	Mm3	231.11	117.25	45.72	53.86	51.15	167.76	666.86

CONSIDERATION AND APPROVAL OF WATER WITHDRAWAL QUOTAS AND OPERATION REGIMES OF THE RESERVOIR CASCADE DURING THE GROWING SEASON 2016 IN THE AMUDARYA AND SYRDARYA RIVER BASINS[2]

Amudarya River Basin

BWO Amudarya submits quotas for the growing season 2016 to ICWC for consideration. These quotas, based on the 100% of water availability, were previously agreed with the national Water Agencies.

The forecast operation regimes of the Nurek and Tuyamuyun reservoirs were developed, taking into account these quotas and for average flow probability. At the same time it should be mentioned that in comparison with previous years the time of drawdown of the Nurek reservoir shifted to ten days.

It should be mentioned also that the current water management situation is not favorable for the growing season 2016.

According to the Hydromet's forecast and analysis of BWO Amudarya, the water availability is expected to be 90% of the norm in the Amudarya River basin, and about 85% of the annual average norm at the Atamurat gauging station upstream of the Garagumdarya during the growing season 2016. Herewith, the Nurek reservoir will operate for energy production (water accumulation in the reservoir), whereas water storage in the Tuyamuyun reservoir is not available in sufficient quantity at the moment.

Taking into account the above-mentioned information, one may suppose that this growing season will be under pressure. To provide a secure and timely supply of water to the Amudarya River water users, supply of sanitary and environmental releases to Prearalie and the Aral Sea, BWO Amudarya proposes to take note of these factors while approving water withdrawal quotas and forecast operation regime.

BWO Amudarya and each water user state in the basin have agreed upon preliminary quotas of water withdrawal at the annual average level for the growing season as follows:

Water withdrawal quota for the Republic of Tajikistan is 6,976.3 Mm^3,

Water withdrawal quota for the Republic of Uzbekistan is 16,020 Mm^3; moreover, for Surkhandarya province it is 1,200 Mm^3.

Water withdrawal quota for Turkmenistan is 15,500 Mm^3.

[2] Information on the second item of the 68th ICWC meting agenda

BWO Amudarya submits the following items to ICWC for consideration and approval for the growing season 2016, taking into account current water management situation and forecast of water availability:

1. Operation regime of the Nurek and Tuyamuyun reservoirs;
2. Quotas of water withdrawal in the Amudarya River basin;
3. Volume of water supply to Prearalie and the Aral Sea;

Quotas of water withdrawal from the Amudarya River and water supply to Prearalie and the Aral Sea for the growing season 2016

NN	River basin, state	Water withdrawal quotas, Mm^3	
		Total annual (from 1.10.15 to 1.10.16)	Including growing season (from 1.04.16 to 1.10.16)
	Total withdrawal from the Amudarya River	55,424	39,696
	Of which:		
1	Republic of Tajikistan	9,854	6,976
2	From the Amudarya River to Atamurat gauging station	44,000	31,520
3	Turkmenistan	22,000	15,500
4	Republic of Uzbekistan	22,000	16,020
	Additionally:		
5	Surkhandarya province	1,570	1,200
6	Plus: - water supply to Prearalie, including irrigation water and CDW	4,200	2,100
7	- sanitary and environmental releases to irrigation systems in:	0.800	
	Dashoguz province	0.150	
	Khorezm province	0.150	
	Republic of Karakalpakstan	0.500	
	Total to the Aral Sea	5,000	2,100

Note: Water withdrawal quotas imply water supply for irrigation, industrial, municipal and other needs. If water availability in the basin changes, the quotas will be adjusted accordingly.

Forecast operation regime of the Nurek reservoir (from April 2016 to September 2016)

Mm^3

	Unit	Actual	Forecast					total
		IV	V	VI	VII	VIII	IX	
Volume: beginning of the period	Mm3	6,744	6,368	6,992	8,262	9,843	10,504	6,744
Inflow to the reservoir	m3/s	416	956	1,383	1,658	1,329	728	
	Mm3	1,079	2,561	3,586	4,441	3,560	1,888	17,113
Release from the reservoir	m3/s	562	723	893	1,068	1,082	728	
	Mm3	1,455	1,936	2,315	2,861	2,898	1,887	13,353
Volume: end of the period	Mm3	6,368	6,992	8,262	9,843	10,504	10,504	10,504
Accumulation (+) drawdown (-)	Mm3	-376	624	1,270	1,581	661	0	3,760

Forecast operation regime of the Tuyamuyun reservoir (from April 2016 to September 2016)

Mm^3

	Unit	Actual	Forecast					total
		IV	V	VI	VII	VIII	IX	
Volume: beginning of the period	Mm3	3,331	2,902	3,061	3,898	3,709	2,828	3,331
Inflow to the reservoir	m3/s	375	756	1,623	1,897	1,569	1,001	
	Mm3	972	2,025	4,207	5,081	4,202	2,595	19,083
Release from the reservoir	m3/s	541	696	1,300	1,968	1,898	1,044	
	Mm3	1,401	1,864	3,,370	5,271	5,084	2,706	19,696
Volume: end of the period	Mm3	2,902	3,061	3898	3,709	2,828	2,717	2,717
Accumulation (+) drawdown (-)	Mm3	-429	159	837	-189	-881	-111	-614

Syrdarya River Basin

According to the Hydromet's forecast for the growing season 2016, received on April 8, 2016, the inflow to the Toktogul reservoir is expected to be 89%, to the Andizhan reservoir – 85% and to the Charvak reservoir – 90% of the norm; the total lateral inflow is expected to be 88% of the norm. Water content in the Syrdarya River during the growing season 2016 is to be 85-95% (Table 2.8).

The normal inflow to the upper reservoirs of the Naryn-Syrdarya cascade is 18,229 Mm³ for the growing season. According to the forecast, it is to be 16,163 Mm³, i.e. 89% or 2,066 Mm³ less than the norm.

The normal lateral infow is 11,010 Mm³. As forecasted, it is to be 9,669 Mm³, i.e. 88% or 1,341 Mm³ less than the norm.

The total normal inflow to the basin during the growing season is 29,239 Mm³. According to the forecast, the total inflow is to be 25,832 Mm³, i.e. 88% or 3,407 Mm³ less than the norm (Table 2.8).

Table 2.8

Forecast water inflow to the Syrdarya River basin during the growing season 2016

Name	norm	Hydromet's forecast					
		volume, Mm³			out of the norm, %		
		min	max	**average**	min	max	**average**
Forecast water inflow to the upper reservoirs:							
Toktogul	9,493	6,909	10,049	**8,479**	73	106	**89**
Andizhan	2,990	2,061	3,003	**2,532**	69	100	**85**
Charvak (Ugam river)	5,746	4,680	5,624	**5,152**	81	98	**90**
Total:	**18,229**	13,650	18,676	**16,163**	75	102	**89**
Forecast lateral inflow:							
Toktogul – Uchkurgan	1,184	913	1,191	**1,052**	77	101	**89**
Uchkurgan, Uchtepe – Bakhri Tochik	3,368	2,688	3,320	**3,004**	80	99	**89**
Andizhan – Uchtepe	2,529	1,818	2,450	**2,134**	72	97	**84**
Bakhri Tochi –Shardara	3,020	2,371	3,005	**2,688**	79	100	**89**
Gazalkent-Chinaz GS-Chirchik (excluding Ugam)	909	551	1,031	**791**	61	113	**87**
Overall:	**11,010**	8,341	10,997	**9,669**	76	100	**88**
TOTAL (total inflow):	**29,239**	21,991	29,673	**25,832**	75	101	**88**

By the beginning of the growing season 2016, the water storage in the reservoirs amounted to18,968 Mm^3.

Toktogul	8,934 Mm^3,
Andizhan	1,013 Mm^3,
Charvak	791 Mm^3,
Bakhri Tochik	3,380 Mm^3,
Shardara	4,850 Mm^3.

By the beginning of the growing season 2016, the water storage in the reservoirs, excluding dead storage, is 11,455 Mm^3. In 2015, this amounted to 7,821 Mm^3 i.e. 3,634 Mm^3 lower (Table 2.9).

By April 1, 2016, the water storage in the Toktogul reservoir, excluding dead storage, amounted to 3,434 Mm^3, i.e. 2,529 Mm^3 more than by the beginning of the growing season 2015.

The water storage in the Andizhan reservoir is 863 Mm^3, i.e. 80 Mm^3 more than in the previous year.

The water storage in the Charvak reservoir is 365 Mm^3, i.e. 203 Mm^3 more than in 2015.

The water storage in the Bakhri Tochik reservoir is 2,463 Mm^3, i.e. 98 Mm^3 less than in 2015.

The water storage in the Shardara reservoir is 4,330 Mm^3, i.e. 940 Mm^3 more than in 2015.

The total water storage is 37 billion 287 million m^3 during the growing season.

Table 2.9

Reservoir	Water storage by April 1, 2016	Dead storage Mm^3	Water storage in the reservoirs by April 1 (Mm^3)			
			including dead storage		excluding dead storage	
			2016	2015	2016	2015
Toktogul	8,934	5,500	8,934	6,405	3,434	905
Andizhan	1,013	150	1,013	953	863	803
Charvak	791	426	791	588	365	162
Bakhri Tochik	3,380	917	3,380	3,478	2,463	2,561
Shardara	4,850	520	4,850	3,910	4,330	3,390
Total	**18,968**	**7,513**	**18,968**	**15,334**	**11,455**	**7,821**

Water withdrawal quotas for the growing season 2016 are proposed for approval, taking into account water requests submitted by water user states (Table 2.10).

Table 2.10

State water withdrawals quotas in the Syrdarya River basin

Water user state	**Quotas (100%), Mm^3**
Republic of Kazakhstan (Dostyk canal)	702
Kyrgyz Republic	246
Republic of Tajikistan	1,905
Republic of Uzbekistan	8,800
Total:	**11,653**

From April 1 to May 10, 2016, water was supplied to the states taking into account their requests and actual water availability (Table 2.11).

Given the quota 48 Mm^3, the actual water intake along the Dostyk canal in the Republic of Kazakhstan amounted to 41 Mm^3 or 86% of the quota.

Given the quota 28 Mm^3, the actual water supply to the Kyrgyz Republic amounted to 34 Mm^3 or 120% of the quota.

Given the quota 300 Mm³, the actual water supply to the Republic of Tajikistan amounted to 211 Mm³ or 70% of the quota.

Given the quota 1,591 Mm³, the actual water supply to the Republic of Uzbekistan amounted to 1,101 Mm³ or 69% of the quota.

Table 2.11

Water user state	**Water withdrawals, Mm³ from April 1,2016 to May 10, 2016**		**%%**
	As of the quota	**Actual**	
Republic of Kazakhstan (Dostyk canal)	48	41	86
Kyrgyz Republic	28	34	120
Republic of Tajikistan	300	211	70
Republic of Uzbekistan	1,591	1,101	69
Total:	**1,967**	**1,387**	71

Taking into account water storage and projected water availability, two options of operation regime are proposed for the Naryn-Syrdarya reservoir cascade during the growing season 2016.

Table 2.12

FORECAST OPERATION SCHEDULE
of the Naryn-Syrdarya reservoir cascade from April 1,2016 to September 30, 2016
(Hydromet's forecast - 88%, quotas - 100%)

Toktogul reservoir		*April-forecast*	*April-actual*	*May*	*June*	*July*	*August*	*September*	*Total, Mm3*
Inflow to the reservoir	*m3/s*	*265.29*	322.73	553.30	840.08	7,51.65	530.58	274.13	
	Mm3	687.63	836.52	1,481.96	2,177.49	2,013.22	1,421.11	710.54	8,640.84
Volume: beginning of the period	*Mm3*	*8,934.00*	***893.00***	***9,110.00***	***9,972.09***	***1,1550.15***	***1,2882.85***	***1,3631.62***	
End of the period	*Mm3*	*8,970.55*	***911.,00***	***9,972.09***	***1,1550.15***	***1,2882.85***	***1,3631.62***	***1,3883.64***	
Release from the reservoir	*m3/s*	*250.00*	268.10	206.57	230.00	250.00	245.00	170.00	
	Mm3	648.00	694.92	553.29	5,96.16	669.60	656.21	440.64	3,610.81
Bakhri Tochik reservoir		*April-forecast*	*April-actual*	*May*	*June*	*July*	*August*	*September*	*Total, Mm3*
Inflow to the reservoir	*m3/s*	*351.74*	445.27	371.16	205.97	133.23	162.09	217.52	
	Mm3	911.71	1,154.13	9,94.11	533.88	356.85	434.15	563.82	4,036.94
Volume: beginning of the period	*Mm3*	*3,379.90*	***3,379.90***	***3,482.10***	***3,440.34***	***2963.89***	***2,232.41***	***1,690.18***	
End of the period	*Mm3*	*3,406.68*	***3,482.10***	***3,440.34***	***2963.89***	***2,232.41***	***1,690.18***	***1,733.99***	
Release from the reservoir	*m3/s*	*340.00*	361.54	336.04	330.00	340.00	310.00	170.00	
	Mm3	881.28	937.10	900.04	855.36	910.66	830.30	440.64	4,874.10
Shardara reservoir		*April-forecast*	*April-actual*	*May*	*June*	*July*	*August*	*September*	*Total, Mm3*
Inflow to the reservoir	*m3/s*	*291.51*	609.60	268.39	197.99	169.26	133.72	208.79	
	Mm3	755.59	1,580.07	718.86	513.19	453.35	358.14	541.18	4,164.81
Volume: beginning of the period	*Mm3*	*4,850.00*	***4,850.00***	***4,919.00***	***4,575.24***	***3,758.73***	***2,551.48***	***1,543.64***	
End of the period	*Mm3*	*4,737.27*	***4,919.00***	***4,575.24***	***3,758.73***	***2,551,48***	***1,543.64***	***1,716.76***	
Release from the reservoir	*m3/s*	*300.00*	427.67	249.03	350.00	450.00	400.00	100.00	
	Mm3	777.60	1,108.51	667.01	907.20	1,205.28	1,071.36	259.20	5,218.56
Release to the Kzylkum canal	*m3/s*	*20.00*	51.00	77.42	110.00	110.00	90.00	25.00	
	Mm3	51.84	132.19	207.36	285.12	294.62	241.06	64.80	1,225.15
Release to the Arnasay depression	*m3/s*	*0.00*	0.00	0.00	0.00	0.00	0.00	0.00	
	Mm3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Supply to the Aral Sea	*m3/s*	*117.50*	26.77	72.45	98.70	120.7	126.30	149.70	

	Mm3	304.56	69.38	194.05	255.83	0 323.28	338.28	388.02	1,568.84
Charvak reservoir		*April-forecast*	*April-actual*	*May*	*June*	*July*	*August*	*September*	*Total, Mm3*
Inflow to the reservoir	*m3/s*	*231.87*	283.48	456.84	528.67	391.65	220.00	130.00	
(4 rivers in total)	*Mm3*	268.28	734.77	1,223.61	1,370.30	1,048.98	589.25	336.96	5,303.87
Volume: beginning of the period	*Mm3*	*791.00*	***791.00***	***1,139.00***	***1,632.32***	***2,010.00***	***1,980.91***	***1,809.34***	
End of the period	*Mm3*	*976.77*	***1,139.00***	***1,632.32***	***2,010.00***	***1,980.91***	***1,809.34***	***1,659.09***	
Release from the reservoir	*m3/s*	*160.00*	152.83	264.84	381.76	400.90	282.26	186.67	
(Release from the Gazalkent HPP)	*Mm3*	1,111.94	396.14	709.34	989.51	1,073.78	756.00	483.84	4,408.62
Andizhan reservoir		*April-forecast*	*April-actual*	*May*	*June*	*July*	*August*	*September*	*Total, Mm3*
Inflow to the reservoir	*m3/s*	*136.80*	96.83	214.27	263.62	172.44	82.88	59.68	
	Mm3	354.59	250.99	573.89	683.30	461.86	221.99	154.69	2,346.73
Volume: beginning of the period	*Mm3*	*1,013.47*	***1,013.47***	***1,023.46***	***1,259.29***	***1,423.26***	***1,159.23***	***842.80***	
End of the period	*Mm3*	*1,107.92*	***1,023.46***	***1,259.29***	***1,423.26***	***1,159.23***	***842.80***	***839.33***	
Release from the reservoir	*m3/s*	*100.00*	92.05	123.78	200.00	270.00	200.00	60.00	
	Mm3	259.20	238.58	331.53	518.40	723.17	535.68	155.52	2,502.89

Таблица 2.13

FORECAST OPERATION SCHEDULE
of the Naryn-Syrdarya reservoir cascade with additional water releases from upper reservoirs to overcome water deficit from April 1,2016 to September 30, 2016 (Hydromet's forecast - 88%, quotas - 100%)

Toktogul reservoir		*April-forecast*	*April-actual*	*May*	*June*	*July*	*August*	*September*	*Total, Mm3*
Inflow to the reservoir	*m3/s*	*265.29*	322.73	553.30	840.08	751.65	530.58	274.13	
	Mm3	687.63	836.52	1,481.96	2,177.49	2,013.22	1,421.11	710.54	8,640.84
Volume:beginning of the period	*Mm3*	*8,934.00*	***8,934.00***	***9,110.00***	***9,972.09***	***11,433.51***	***12,578.72***	***13,327.49***	
End of the period	*Mm3*	*8,970.55*	***9,110.00***	***9,972.09***	***11,433.51***	***12,578.72***	***13,327.49***	***13,579.51***	
Release from the reservoir	*m3/s*	*250.00*	268.10	206.57	275.00	320.00	245.00	170.00	
	Mm3	648.00	694.92	553.29	712.80	857.09	656.21	440.64	3,914.94
Bakhri Tochik reservoir		*April-forecast*	*April-actual*	*May*	*June*	*July*	*August*	*September*	*Total, Mm3*
Inflow to the reservoir	*m3/s*	*35.74*	445.27	371.16	250.97	209.68	212.09	217.52	
	Mm3	911.71	1,154.13	994.11	650.52	561.61	568.07	563.82	4,492.26
Volume:beginning of the period	*Mm3*	*3,379.90*	***3,379.90***	***3,482.10***	***3,440.34***	***2,950.93***	***2,129.59***	***1.667.71***	
End of the period	*Mm3*	*3,406.68*	***3,482.10***	***3,440.34***	***2,950.93***	***2,129.59***	***1,667.71***	***1,711.51***	
Release from the reservoir	*m3/s*	*340.00*	361.54	336.04	380.00	450.00	330.00	170.00	
	Mm3	881.28	937.10	900.04	984.96	1,205.28	883.87	440.64	5,351.89
Shardara reservoir		*April-forecast*	*April-actual*	*May*	*June*	*July*	*August*	*September*	*Total, Mm3*
Inflow to the reservoir	*m3/s*	*291.51*	609.60	268.39	197.99	169.26	133.72	208.79	
	Mm3	755.59	1,580.07	718.86	513.19	453.35	358.14	541.18	4,164.81
Volume:beginning of the period	*Mm3*	*4,850.00*	***4,850.00***	***4,919.00***	***4,575.24***	***3,758.73***	***2,551.48***	***1,543.64***	
End of the period	*Mm3*	*4,737.27*	***4,919.00***	***4,575.24***	***3,758.73***	***2,551.48***	***1,543.64***	***1,716.76***	
Release from the reservoir	*m3/s*	*300.00*	427.67	249.03	350.00	450.00	400.00	100.00	
	Mm3	777.60	1,108.51	667.01	907.20	1,205.28	1,071.36	259.20	5,218.56
Release to the Kzylkum canal	*m3/s*	*20.00*	51.00	77.42	110.00	110.00	90.00	25.00	
	Mm3	51.84	132.19	207.36	285.12	294.62	241.06	64.80	1,225.15
Release to the Arnasay depression	*m3/s*	*0.00*	0.00	0.00	0.00	0.00	0.00	0.00	
	Mm3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Supply to the Aral Sea	*m3/s*	*117.50*	26.77	72.45	98.70	120.7	126.30	149.70	

	Mm3	304.56	69.38	194.05	255.83	0 323.28	338.28	388.02	1,568.84
Charvak reservoir		*April-forecast*	*April-actual*	*May*	*June*	*July*	*August*	*September*	*Total, Mm3*
Inflow to the reservoir	*m3/s*	*231.87*	283.48	456.84	528.67	391.65	220.00	130.00	
(4 rivers in total)	*Mm3*	268.28	734.77	1,223.61	1,370.30	1,048.98	589.25	336.96	5,303.87
Volume:beginning of the period	*Mm3*	*791.00*	***791.00***	***1,139.00***	***1,632.32***	***2,010.00***	***1,980.91***	***1,809.34***	
End of the period	*Mm3*	*976.77*	***1,139.00***	***1,632.32***	***2,010.00***	***1,980.91***	***1,809.34***	***1,659.09***	
Release from the reservoir	*m3/s*	*160.00*	152.83	264.84	381.76	400.90	282.26	186.67	
(Release from the Gazalkent HPP)	*Mm3*	1,111.94	396.14	709.34	989.51	1,073.78	756.00	483.84	4,408.62
Andizhan reservoir		*April-forecast*	*April-actual*	*May*	*June*	*July*	*August*	*September*	*Total, Mm3*
Inflow to the reservoir	*m3/s*	*136.80*	96.83	214.27	263.62	172.44	82.88	59.68	
	Mm3	354.59	250.99	573.89	683.30	461.86	221.99	154.69	2,346.73
Volume:beginning of the period	*Mm3*	*1,013.47*	***1,013.47***	***1,023.46***	***1,259.29***	***1,423.26***	***985.13***	***534.79***	
End of the period	*Mm3*	*1,107.92*	***1,023.46***	***1,259.29***	***1,423.26***	***985.13***	***534.79***	***531.31***	
Release from the reservoir	*m3/s*	*100.00*	92.05	123.78	200.00	335.00	250.00	60.00	
	Mm3	259.20	238.58	331.53	518.40	897.26	669.60	155.52	2,810.90

ANALYSIS OF THE WATER MANAGEMENT SITUATION IN THE SYRDARYA AND AMUDARYA RIVER BASINS OVER THE NON-GROWING SEASON 2015-2016

1. Syrdarya River Basin

The actual inflow to the upstream reservoirs in the Syrdarya basin (Toktogul, Andizhan, and Charvak reservoirs) was 6.25 km³ or 121% of the forecast during the non-growing season. The actual water release was 10.81 km³ from the reservoirs.

The total lateral inflow in the reach from the Toktogul reservoir to the Shardara reservoir, including spills along the Karadarya and Chirchik rivers, was 11.58 km³. This is 1.9 times more than the total inflow to the upstream reservoirs.

By the end of the non-growing season, 10.74 km³ were accumulated in the upstream reservoirs, including 8.93 km³ in the Toktogul reservoir or 97% of the BWO Syrdarya's scheduled amount.

The inflow to the Toktogul reservoir was 3.38 km³. Water in the amount of 7.44 km³, which is 0.89 km³ more than scheduled by the BWO Syrdarya, was released from the reservoir. From the third ten-day of October to the second ten-day of February, the actual water releases from the Toktogul reservoir exceeded the BWO Syrdarya's scheduled amount.

During the non-growing season 2015-2016, the inflow to the Bakhri Tochik reservoir amounted to 11.84 km³, which is 1 km³ more than scheduled by the BWO Syrdarya (during the non-growing season 2014-2015 the inflow was higher - 12.42 km³); the water releases were 9.8 km³ from the reservoir (in 2014-2015 – 9.75 km³). The accumulation of water in the reservoir amounted to 1.75 km³ to 3.38 km³ (as of April 1, 2015, it was 3.48 km³). The actual water releases from the reservoir exceeded the BWO Syrdarya's scheduled amount from the third ten-day of October to the second ten-day of January, as well as on the first and second ten-days of February and the third ten-day of March.

During the non-growing season, the total water diversion from the Naryn and Syrdarya rivers in the reach up to Shardarya reservoir was 3.62 km³, of which: for the Kyrgyz Republic – 0.03 km³, the Republic of Tajikistan – 0.02 km³, the Republic of Kazakhstan (along the Dustlik canal) – 0.49 km³, and for the Republic of Uzbekistan – 3.08 km³.

The water losses amounted to 1.95 km³ in the reach Toktogul-Shardara (estimated by using the balance method). For comparison, these losses amounted to 1.51 km³ in the same reach during the non-growing season 2014-2015.

Water supply was uneven for the states, the river reaches and unstable in time (Table 1.1).

The inflow to the Shardara reservoir during the non-growing season 2015-2016

was 11.03 km³, which is 1.39 km³ less than the BWO Syrdarya's scheduled amount. Thus, despite the excess of the actual water releases over the planned releases from the Bakhri Tochik reservoir, the actual inflow to the Shardara reservoir was less than scheduled (planned) one. The reason is the limited inflow (as compared to the forecast) along the Chrichik River and the return flow in the reach Bakhri Tochik-Shardara. The amount of 7.2 km³ was discharged into the river from the Shardara reservoir, the water diversion for the Kyzylkum canal was 0.21 km³. There was no release to Arnasay. The amount of 1.76 km³ was accumulated in the Koksaray.

In the reach of Shardara-Karateren, the water diversion to the lake systems was 2.11 km³, and flow losses were 0.91 km³. According to the data of UzHydromet, the actual water supply to the Aral Sea was 3.12 km³, whereas KazHydromet informed that it was 3.03 km³.

Table 1.2 provides the Syrdarya River channel water balance, and Table 1.3 gives the water balance of the reservoirs.

Table 1.1

Water availability in the Syrdarya River basin countries for the non-growing season 2015-2016

№	Water user	Water volume, km³		Water availability, %	Deficit (-), surplus (+), km³
		Quota/ schedule	Actual	Season	Season
1	Total water diversion	3.30	3.62	110	0.32
2	Water diversion by state:				
	Kyrgyz Republic	0.04	0.03	72	-0.01
	Republic of Uzbekistan	2.48	3.08	124	0.60
	Republic of Tajikistan	0.37	0.02	4	-0.35
	Republic of Kazakhstan	0.41	0.49	120	0.08
3	By river reach				
3.1	Toktogul reservoir – Uchkurgan hydroscheme	1.37	1.49	109	0.12
	of which:				
	Kyrgyz Republic	0.030	0.024	79	-0.006
	Republic of Tajikistan	0.085	0.003	4	-0.082
	Republic of Uzbekistan	1.252	1.459	116	0.207
3.2	Uchkugran hydroscheme – Bakhri Tochik hydroscheme	0.25	0.23	93	-0.018
	of which:				
	Kyrgyz Republic	0.007	0.003	41	-0.004
	Republic of Tajikistan	0.069	0.002	3	-0.067
	Republic of Uzbekistan	0.171	0.224	131	0.053
3.3	Bakhri Tochik hydroscheme – Shardara reservoir	1.68	1.90	113	0.22
	of which:				
	Kyrgyz Republic	0.410	0.492	120	0.08

№	Water user	Water volume, km^3		Water availability, %	Deficit (-), surplus (+), km^3
		Quota/ schedule	Actual	Season	Season
	Republic of Tajikistan	0.214	0.011	5	-0.20
	Republic of Uzbekistan	1.060	1.400	132	0.34
4	Inflow to the Shardara reservoir	12.42	11.03	89	-1.39
	Discharge into Arnasay	0.00	0.00		0.00
5	Water supply to the Aral Sea (Karateren gauging station)	1.99	3.12	157	1.13

Table 1.2

Syrdarya River channel water balance for the non-growing season 2015-2016

№	Balance item	Water volume, km^3		Deviation (actual - plan)
		Forecast/plan	Actual	
1	Inflow to the Toktogul reservoir	2.80	3.38	0.58
2	Lateral inflow at the river reach of Toktogul reservoir – Shardara reservoir (+)	10.75	11.58	0.83
	of which:			
2.1	*Water releases to the Karadarya river*	1.71	1.74	0.03
2.2	*Water releases to the Chirchik river*	2.07	1.52	-0.54
2.3	Lateral inflow from CDF and small rivers	6.97	8.31	1.35
3	Flow regulation in the reservoirs: inflow (+) or diversion (-)	2.00	1.63	-0.37
	of which:			
3.1	*Toktogul reservoir*	3.75	4.06	0.31
3.2	*Bakhri Tochik reservoir*	-1.75	-2.43	-0.68
4	Regulated flow (1+2+3)	15.55	16.59	1.04
5	Water diversion at the reach Toktogul – Shardara (-)	-3.30	-3.62	-0.32
6	Water losses (-) or unrecorded inflow to the channel (+) at the reach of Toктogul-Shardara	0.17	-1.95	-2.12
6.1	Including % of the regulated flow	1	12	
7	Inflow to the Shardara reservoir	12.42	11.03	-1.39
8	Flow regulation in the Shardara reservoir: inflow (+) or diversion (-)	-4.18	-3.62	0.56
9	Water releases from the Shardara reservoir	8.16	7.20	-0.96
10	Water releases to the Kzylkum canal (-)	-0.08	-0.21	-0.13
11	Discharge into Arnasay (-)	0.00	0.00	0.00
12	Water diversion for the Koksaray reservoir	-	1.76	
13	Water releases from the Koksaray reservoir	-	0.00	
14	Discharge into the Arys river	-	0.70	
15	Water diversion, including lake systems (-)	-	-2.11	
16	Water losses (-), lateral inflow (+)	-	-0.91	
	Including % of the water releases from the Shardara reservoir+ the Arys river		12	

№	Balance item	Water volume, km^3		Deviation (actual - plan)
		Forecast/plan	Actual	
17	Water supply to the Aral Sea (Karateren GS)	1.99	3.12	1.13

Table 1.3

Water balance of the Syrdarya River basin reservoirs for the non-growing season 2015-2016

№	Balance item	Water volume, km³		Deviation (actual-plan)
		Forecast/Plan	Actual	
1	**Toktogul reservoir**			
1.1	Inflow to the reservoir	2.80	3.38	0.58
1.2	Water volume in the reservoir:			
	- beginning of the season (October 1, 2015)	13.01	13.01	0.00
	- end of the season (April 1, 2016)	9.24	8.93	-0.31
1.3	Water releases from the reservoir	6.55	7.44	0.89
1.4	Unrecorded inflow (+) or losses (-)	-0,01	-0,01	-0,002
	Including % of inflow to the reservoir	0	0	0
1.5	Flow regulation: inflow (+) or diversion (-)	3.75	4.06	0.31
2	**Andizhan reservoir**			
2.1	Inflow to the reservoir	0.95	0.91	-0.04
2.2	Water volume in the reservoir:			
	- beginning of the season (October 1, 2015)	0.79	0.79	0.00
	- end of the season (April 1, 2016)	1.22	1,01	-0.21
2.3	Water releases from the reservoir	0.52	0.67	0.15
2.4	Unrecorded inflow (+) or losses (-)	0.00	-0.02	-0.02
	Including % of inflow to the reservoir	0	2	2
2.5	Flow regulation: inflow (+) or diversion(-)	-0.43	-0.24	0.19
3	**Charvak reservoir**			
3.1	Inflow to the reservoir	1.43	1.96	0.53
3.2	Water volume in the reservoir:			
	- beginning of the season (October 1, 2015)	1.59	1.59	0.00
	- end of the season (April 1, 2016)	0.88	0.79	-0.08
3.3	Water releases from the reservoir	2.13	2.70	0.57
	Unrecorded inflow (+) or losses (-)	-0.01	-0.06	-0.05
	Including % of inflow to the reservoir	1	3	2
3.5	Flow regulation: inflow (+) or diversion(-)	0.71	0.74	0.03
4	**Bakhri Tochik reservoir**			
4.1	Water inflow to the reservoir from the river	10.85	11.84	1.00
4.2	Lateral inflow	0.300	0.39	0.09
4.3	Water volume in the reservoir:			
	- beginning of the season (October 1, 2015)	1.75	1.75	0.00
	- end of the season (April 1, 2016)	3.42	3.38	-0.04
4.4	Water releases from the reservoir	9.40	9.80	0.41

№	Balance item	Water volume, km³		Deviation (actual-plan)
		Forecast/Plan	Actual	
	of which:			
	- releases to the river	9.33	9.80	0.47
	- diversion from the reservoir	0.07	0.00	-0.07
4.5	Unrecorded inflow (+) or losses (-)	-0.08	-0.80	-0.72
	Including % of inflow to the reservoir	1	7	6
4.6	Flow regulation: inflow (+) or diversion (-)	-1.75	-2.43	-0.68
5	**Shardara reservoir**			
5.1	Inflow to the reservoir	12.42	11.03	-1.39
5.2	Lateral inflow	0.0	0.0	0.00
5.3	Water volume in the reservoir:			
	- beginning of the season (October 1, 2015)	1.22	1.22	0.00
	- end of the season (April 1, 2016)	5.311	4.850	-0.46
5.4	Water releases from the reservoir	8.07	6.98	-1.09
	of which:			
	- Discharge to Arnasay	0.00	0.00	0.000
	- Releases to the river	8.16	7.20	-0.96
	- water diversion from the reservoir	-0.08	-0.21	-0.13
5.5	Unrecorded inflow (+) or losses (-)	-0.26	-0.42	-0.16
	Including % of inflow to the reservoir	2	4	2
5.6	Flow regulation: inflow (+) or diversion(-)	-4.35	-4.05	0.30
6	**Koksaray reservoir**			
6.1	Water inflow to the reservoir	-	1.76	
6.2	Water volume in the reservoir:			
	- beginning of the season (October 1, 2015)	-	0.00	
	- end of the season (April 1, 2016)	-	1.64	
6.3	Water releases from the reservoir	-	0.00	
6.4	Unrecorded inflow (+) or losses (-)		-0.12	
	Including % of inflow to the reservoir	-	7	
6.5	Flow regulation: inflow (+) or diversion(-)		-1.76	
7	**Total** flow regulation by reservoirs: inflow (+) or diversion (-)	-2.07	-3.68	-1.61
8	**Total** unrecorded inflow (-), or losses (+)	-0.36	-1.43	-1.07

2 Amudarya River Basin

The actual water availability in the Amudarya River at the Atamyrat gauging station (upstream of the intake to Garagumdarya), excluding the water diversion to Syrdarya province, was 12.63 km³, which is 1% less than expected by the BWO Amudarya's scheduled amount.

The established quota of water diversion in the Amudarya River basin was 96% used; the water diversion amounted to 15.17 km³, including 12.31 km³ downstream of the Atamyrat gauging station (starting from the intake to Garagumdarya).

The water availability was unequal for the states and river reaches (Table 2.1). The total water deficit was 4%, of which: the Republic of Tajikistan – 13%, the Republic of Uzbekistan – 0.1%, and Turkmenistan – 4%.

By the end of the season, 6.74 km³ of water was managed to be kept in the Nurek reservoir, and 3.33 km³, in the TMHS reservoirs. The inflow to the Nurek reservoir was 3.86 km³, the water releases were 7.64 km³. The surplus to the river flow due to the drawdown of the Nurek reservoir was 3.78 km³. The actual water releases from the Nurek reservoir differed from the releases scheduled by the BWO Amudarya: from October to January they were less than scheduled releases, and from February to March they exceeded the planned ones. Thus, the actual water releases (the total ones for the non-growing season) from the Nurek reservoir exceeded the scheduled ones by 0.86 km³. Despite this, due to the higher inflow (as compared to the schedule) to the reservoir, by the 1st of April the actual water volume in the reservoir exceeded the scheduled one by 0.5 km³.

In the Tuyamuyun hydroscheme reservoirs (TMHS reservoirs), the water accumulation plan has not been achieved – by the 1st of April the actual water volume was less than the scheduled one by 0.81 km³. The water releases schedule from the TMHS was fully observed. The failure to implement the water accumulation plan is explained by the limited inflow to the in-stream reservoir as expected (lower by 0.43 km³) and the excessive actual water diversion than scheduled (more by 0.11 km³).

The water losses in the reach of Atamyrat-Birata amounted to 3.11 km³ or 19% of the regulated flow at the Atamyrat GS. The water losses in the river reach from the Tyuyamuyun gauging station up to the Samanbay gauging station were 0.38 km^3 or 6 % of the river flow in the section of the Tyuyamuyun gauging station.

The established quotas for environmental water releases to the Amudarya downstream canals were 94% used; the water supply was 0.75 km³. An amount of 3.3 km³ or 157% of the scheduled one were supplied to Prearalie and the Aral Sea.

Table 2.2 provides data on the river channel balance, and Table 2.2 gives the water balance of the reservoirs.

Table 2.1

Water availability in the Amudarya River Basin countries for the non-growing season 2015-2016

№	Water user	Water volume, km³		Water availability, %	Deficit (-), surplus (+) km³
		Quota/ Schedule	Actual	Season	Season
1	Total water diversion	15.73	15.17	96	-0.56
2	Diversion by state:				
	Kyrgyz Republic	-	-	-	-
	Republic of Tajikistan	2.88	2.49	87	-0.38
	Turkmenistan	6.5	6.32	97	-0.17
	Republic of Uzbekistan	6.35	6.36	100	0.01
3	Downstream of Atamyrat GS	12.48	12.31	99	-0.17
	of which:				
	Turkmenistan	6.5	6.32	97	-0.18
	Republic of Uzbekistan	5.98	5.99	100	0.01
4	By river reache:				
	Upstream	3.25	2.86	88	-0.39
	of which:				
	Kyrgyz Republic	-	-	-	-
	Republic of Tajikistan	2.88	2.49	87	-0.38
	Republic of Uzbekistan, Surkhandarya province	0.37	0.37	99	0.00
	Midstream	8.34	8.18	98	-0.16
	of which:				
	Turkmenistan	5.10	4.88	96	-0.22
	Republic of Uzbekistan	3.24	3.30	102	0.05
	Downstream	4.14	4.12	100	-0.02
	of which:				
	Turkmenistan	1.4	1.43	102	-0.03
	Republic of Uzbekistan	2.74	2.69	98	-0.05
5	Environmental water releases to canals in the river lower reaches	0.80	0.75	94	-0.05
	of which:				
	Turkmenistan	0.15	0.14	94	-0.01
	Republic of Uzbekistan	0.65	0.61	94	-0.04
6	Water supply to the Aral Sea and Prearalie	2.1	3.30	157	1.20

Table 2.2

The Amudarya River channel water balance for the non-growing season 2015-216

№	Balance item	Water volume, km^3		Deviation (actual-plan)
		Forecast/ Plan	Forecast/Plan	
1	Water content of the Amudarya river - non-regulated flow at the Atamyrat GS *	12.77	12.63	-0.14
2	Flow regulation in the Nurek reservoir: accumulation (+) or diversion (-)	4.31	3.78	-0.53
3	Water diversion in the midstream (-)	-8.34	-8.18	0.16
4	Midstream return CDF (+)	1.22	1.36	0.14
5	Water losses (-) or unrecorded inflow to the channel (+)	-3.08	-3.14	-0.07
	% of the regulated flow	18	19	1
6	Inflow to the TMHS (Bir-Ata GS)	6.88	6.45	-0.43
7	Flow regulation in the TMHS reservoirs: accumulation (+) or diversion (-)	1.56	2.10	0.55
8	Releases from TMHS (including water diversion from the reservoir)	8.44	8.55	0.11
9	Downstream water diversion, including diversion from TMHS (-)	-4.29	-4.12	0.16
10	Downstream return CDF (+)	0.00	0.00	0.00
11	Emergency and environmental water releases to canals (-)	-0.80	-0.75	0.05
12	Runoff losses (-) or unrecorded inflow to the channel (+)	-1.25	-0.38	0.87
	% of the flow at the section of the Tuyamuyun gauging station	20	6	-14
13	Water supply to Prearalie and the Aral Sea	2.10	3.30	1.20
14	**TOTAL** losses:	-4.33	-3.52	0.81
	% of the regulated flow	25	21	-3.89

* Minus upstream water diversions (Tajikistan and Surkhandarya province)

Table 2.3

Water balance of the Amudarya River basin's reservoirs for the non-growing season 2015-2016

№	Balance item	Water volume, km3		Deviation (actual-plan)
		Forecast / plan	Actual	
1	**Nurek reservoir**			
1.1	Inflow to the reservoir	3.58	3.86	0.27
1.2	Water volume in the reservoir:			
	- beginning of the season (October 1, 2015)	10.52	10.50	-0.02
	- end of the season (April 1, 2016)	6.24	6.74	0.50
1.3	Water releases from the reservoir	7.90	7.64	-0.25
1.4	Lateral inflow (+) or water losses (-)	0.03	0.03	0.00
	Including % of the inflow to the reservoir	1	1	0
1.5	Flow regulation: accumulation (+) or diversion (-)	4.31	3.78	-0.53
2.0	**TMHS reservoirs**			
2.1	Inflow to the TMHS	6.88	6.45	-0.43
2.2	Water volume in the reservoirs:			
	- beginning of the season (October 1, 2015)	5.52	5.43	-0.09
	- end of the season (April 1, 2016)	4.14	3.33	-0.81
2.3	Water releases from the TMHS	8.44	8.55	0.11
	of which:			
	- releases to the river	6.38	6.38	0.00
	- water diversion	2.06	2.17	0.11
2.,4	Unrecorded inflow (+) or water losses (-)	0.18	0.00	-0.18
	Including % of the inflow to the reservoir	-3	0	3
2.5	Flow regulation: accumulation (+) or diversion (-)	1.56	2.10	0.55
	Total flow regulation by the reservoirs: accumulation (+) or diversion (-)	5.87	5.89	0.02
	Total losses (-), unrecorded inflow (+)	0.21	0.03	-0.18

INTERNATIONAL CONFERENCE OF THE NETWORK OF (BASIN) WATER ORGANIZATIONS FROM EASTERN EUROPE, CAUCASUS AND CENTRAL ASIA "CULTURAL AND EDUCATIONAL ISSUES RELATED TO WATER MANAGEMENT IN THE EECCA COUNTRIES"

February 9-10, 2016, Almaty, Republic of Kazakhstan

The key topics for discussion were:

- Water and culture;
- Water and civilization;
- Water and ethics;
- Water and education.

The Executive Secretary of EECCA NWO Prof. V.A. Dukhovniy opened the Conference.

The welcome speeches were delivered by:

- P.A.Polad-Zadeh, President, EECCA NWO (in form of a video message)
- D.P.Putyatin, Director, Department of Land Reclamation, Ministry of Agriculture, Russian Federation
- B. Libert, Regional Advisor for Environment, UNECE
- A. Chevelev, Officer-in-Charge of UNESCO Almaty Cluster Office
- E.Tardieu, Deputy Secretary General of International Network of Basin Organizations

Further, the following reports were presented:

Prof. V.A.Dukhovniy - Water and ethics in the modern world

B.Libert - International conventions as an expression of water ethics

E.Tardieu - COP21 and INBO initiative "Paris Pact on water and adaptation to climate change in the basins of rivers, lakes and aquifers"

V.I.Sokolov - Moral and ethical aspects of the society commitment to water security

A.D.Ryabtsev - Regional water strategy at present stage of water development in the Aral Sea Basin

Prof. N.B. Prokhorova - The role of Water Museum in educational and cultural space

Acad. B.M.Kizyaev - Environmental and social aspects related to water use in the Russia's regions

Prof. V.A.Stashuk - Water resources in Ukraine: history and present-day

N.Kim – UNESCO-IHP activities: from global to regional perspectives

Prof. D.V.Kozlov - Innovative system of water education in the era of ambitious education and science reforms in Russia

O.I.Eshtchanov - Monitoring results of ASBP-3: water management actions to the benefit of EECCA

Ye. Simonov - New Silk Road – risks and opportunities for water sector

Prof. M.Yu.Kalinin - Experience in developing curricula for the postgraduate course on integrated water resources management as part of the EU Tempus Program

N.P. Mamataliev - Adoption of Integrated Water Resources Management in curricula of the Kyrgyz National Agricultural University named by K.I.Skryabin

M.Ya.Makhramov - Water and civilization

A.R.Uktamov - Construction of interstate main canals in the Syrdarya river basin and their current conditions

A. Tairov - About activity of the Intersectoral Work Team on hydrological risks

D.Dadobayev - Education for integrated water management and improved water use in the Republic of Tajikistan

The President of EECCA NWO Acad. **P.A.Polad-Zadeh** underlined in his video message that the present day set a number of institutional challenges to overcome at the national level. These were the right to water and the value of water. Each user should have a legally enforceable right to water. Moreover, water should have its value.

He paid attention to the fact that since 1990 no large hydraulic structure had been built in Russia to improve lives of people and enable better performance.

"Undoubtedly, the time is not far off when international relations, and moreover, challenges for the leadership in the world would be focused around possession of freshwater rather than that of oil and gas.

In the XX century, huge investments were made in land reclamation and water sectors in the former united country. All this has been performing well still. However, life does not stand still and new challenges arise. Climatologists warn about significant changes in climate and, consequently, in water resources. To a larger extent, this would affect the regions that already experience water scarcity. The problem will be aggravated through demographic challenges, demand for import substitution, and

deterioration of earlier built hydraulic structures. Therefore, we must anticipate these processes.

In this context, I think it necessary to appeal to the leaders of our countries for early elaboration of the Master plans for integrated water use and agricultural land reclamation, at least, by 2030 and better by 2050.

At the same time, particular attention should be paid to complete solution of transboundary water problems inside our commonwealth. I would like to remind you that we have proven records of implementation of related projects", said P.A.Polad-Zadeh.

Director of the Department for Land Reclamation at the Russian Federation's Ministry of Agriculture **D.P.Putyatin** in his speech informed about the initiative of the Ministry to establish a Coordination Council for reclamation of agricultural land at the CIS Intergovernmental Agro-industrial Council. Enhancement of cooperation among the CIS member-states would be the key for the development of agroindustry and achievement of food security in these states. From the transboundary perspective of available water and land resources, this synergy would help to address very important issues related to soil fertility, preservation and expansion of reclaimed land areas, etc.

It is expected that the Coordination Council would be a venue for meaningful dialogue and experience sharing, including in the area of specifications, design, construction and rehabilitation, operation of land reclamation systems and hydraulic structures, and water supply systems. As a separate area of activity, it is proposed to consider capacity building in this area.

WATER AND ETHICS

In the key report Executive Secretary of EECCA NWO **Prof. V.A.Dukhovniy** underlined that before severe human intervention in the natural environment, the major focus of ethics have been on the rules of moral behavior, social relationships, and family relations in order to keep humanity as it was created by God. Development of business, financial relations and industry gave birth to ethical rules in these areas. However, those did not address relations with the nature. Later on, with recognition of the holy and unique nature of water and the need to treat it carefully as a thing to be preserved not only as a means for production of goods and meeting of basic needs but for sustainable life on the Earth, absolutely new ethical rules occurred in the face of future threats. Devastating environmental degradation and, first of all, of water resources poses an existential threat.

The main tools of water ethics include:

- Key tool is a *consciousness and understanding* of the unique nature of water and its role for preservation and survival of humankind, natural flora and fauna, and for noosphere.

- *Religion*
- *Education***,** which includes learning of the rules and regulations for efficient water use and management
- *Culture* with its diverse areas (literature, art, press, the cinema, folk arts)
- *Law* as a regulation tool of social relations
- *Gender* is a very sensitive tool from the perspective of moral social relations
- Mass media

Prof. Dukhovniy also stressed that interstate relations, especially in the field of water, were based on trust. Trust was defined as a will to act together. The degree of trust depends on the consistency of relations, the community of situation and history of their relations for overcoming circumstances.

Close relationships between ethics and water security were demonstrated in the presentation of the Regional Coordinator of GWP CACENA **V.I. Sokolov**.

The key dimensions of water security as formulated by ADB[3] are as follows:

- Household water security
- Economic water security
- Urban water security
- Environmental water security
- Resilience to water-related disasters

Based on the above dimensions, one may assume the following interpretation in context of general water security:

- Food security is the basis for peace
- Economic security is the basis for progress
- Environmental security (sustainability) is the basis for enough amounts of water for food security and economic security

Thus, the issues related to water security could be addressed if the humanity recognizes water as one of moral values. The moral values are understood as a system of worldview, which characterizes everything from a perspective of good and evil, happiness, justice, and love. Such characterization allows establishing the relationship between the human actions and the generally recognized system of social values and choosing the so called moral stand for further steps or actions.

Decision makers should understand that today water is a matter for diplomacy

[3] Asian Water Development Outlook 2013: Measuring Water Security in Asia and the Pacific (ADB, 2013)

rather than a political weapon. From water perspective, there should be no enemies but only opponents in the dialogue seeking for consensus. And in such water dialogue the parties must try to listen to their opponents and take their arguments into consideration.

Given that every person chooses which meaning to assign to one or another phenomenon, in part of water dialogue, first of all, we should achieve common understanding of equity or justice regarding water. Evidently, equity has many perspectives; therefore, the mutually acceptable indicators of equity should be agreed upon.

From this point of view, it is very important that the moral values be translated into legal regulations for water relations. In this context, two UN Water Conventions 1992 and 1997 being the frameworks of international water cooperation could serve as such regulations.

The Regional Advisor of UNECE **B.Libert** presented implementation of the above-mentioned International Water Conventions in context of water ethics. Particularly, he showed that the UNECE Convention as a legal framework tool was based on the holistic approach, which determined:

- Concept of the catchment area
- Surface and ground water and relationship with the sea where they flow into
- Transboundary impact as adverse effects on human health and safety, flora, fauna, soil, air, water, climate, landscape and historical monuments or other physical structures, as well as socio-economic conditions

For implementation of the Convention 1992 on the Protection and Use of Transboundary Watercourses and International Lakes a number of guidance notes and recommendations was developed and published:

- Guidance on water and adaptation to climate change
- Guidance on monitoring and assessment of transboundary rivers, lakes and groundwater
- Model provisions on transboundary flood management
- Model provisions on transboundary groundwater
- Guide to access to information and public participation

In addition, the Implementation Committee under the Water Convention was established to fulfill the following functions:

- Prevent disputes, not allowing disputes
- Hands-on assistance in any particular cases
- 9 members, individually, remarkable lawyers and water professionals
- Procedures (advisory procedure, undertaking a Committee initiative, etc.)

- Taking measures (national implementation plan, transboundary water cooperation agreement, capacity building, financing support), recommending to the Meeting of the Parties that it takes solid steps

WATER AND CULTURE

Prof. N.B.Prokhorova, Director of RosNIIVH in her report showed the role of Water Museum opened at RosNIIVH in educational and cultural space of the city of Yekaterinburg. This Museum includes the following sections:

- Russia's water fund;
- Waterways (history of water development in Russia);
- Establishment of water management agencies;
- Development of hydraulic engineering;
- Hydrotechnical land reclamation;
- Water use;
- Integrated water resources management;
- Water risks;
- Restoration and protection of the water fund;
- Physicochemical properties of water.

Prof. **V.A.Stashuk** from the "Union of Ukrainian Water Professionals" told that in Ukraine water resources have been tightly connected with its history and culture. According to the chronicle, the Slavs settled from the earliest times along the river banks:

- Polans – along the Dnepr River, not far from the Desna River mouth;
- Severiane – in the Desna and Seim basins;
- Radimichi – in the upstream of the Dnepr River;
- Drevlians – along the Pripyat River;
- Dregovichi – between the Pripyat and Western Dvina Rivers.

At present, every year the Rivers Day is organized in the basins of Tisa, Severskiy Donets, Dnestr, and Dnepr.

Restoration of springs and river sources is in the focus now. Since the beginning of this project, about 5,000 springs and river sources have been restored.

WATER AND CIVILIZATION

Environmental and social perspectives of water use in the Russia's regions were addressed in the presentation of Acad. **B.M.Kizyaev**, Director of VNIIGiM. He underlined that the water use issues had a multifactor character in Russia and related to:

- Economic problems:
  - imperfect economic mechanisms for national water management, water use regulation, and water saving and protection encouragement;
  - poor investment in the water sector;
  - high water intensity of industries, etc.
- Technical problems:
  - deterioration and aging of basic production assets, including basic funds of protection and rational use of water resources;
- Environmental problems:
  - non-uniform distribution of surface and ground water in space;
  - deterioration of surface water quality;
  - natural and human induced pollution of groundwater;
  - over-abstraction of river runoff and groundwater depletion in the regions with man-induced impact, etc.

M.Ya. Makhramov, Director of BWO Amudarya showed in his report the relationship between water resources and human civilization. The scientists have noted long ago that all ancient civilizations originated along big rivers and in their valleys, such as Tigris and Euphrates, Nile, Indus and Ganges, Yellow River and Yangtze, Amudarya, Syrdarya and many others. Those rivers played a very important role in lives of people in terms of farming and trade.

People constructed irrigation structures along the rivers but this required common efforts of local tribes rather than of single person or family. Thus, the nations living in river basins from their early existence had strong benefits for civilization development and progress.

Earlier civilizations were characterized by systems for artificial irrigation of agricultural land through channels. By using these channels, people diverted water from the rivers to moisture soil and reduce the risk of droughts and floods. Moreover, construction of channels in the north of tropical regions helped to avoid water logging.

Another feature of ancient civilizations, as many researchers note, is that they occurred in the regions with limited water resources. This limited nature of water encouraged them to seek for efficient technologies and take restrictive measures as a way to save and protect water.

Thus, everyone should understand that water is a strategic resource which predetermines the future economic situation in the countries. And it is time to think whether our future generation will have enough water or not. One should fully realize the supreme value of the resource everybody is need of. Water is life.

The presentation of Mr. **A.Uktamov** from BWO Syrdarya was dedicated to construction of the interstate main canals in the first half of XX century in the Syrdarya basin and their present status.

One of dramatic and important developments in the Fergana Valley was the construction of the Big Fergana Canal (BFC) in 1939 completed during 45 days. For this construction more than 180,000 people were mobilized for work-for-the-nation and the canal was completed as early as in 45 days. 18 million cubic meters of land (stones, sand, and clay) were dug manually with shovels, grub hoes and other implements on hand. The headwork had the eight bays with vertical lift gates and the total capacity was 100 m^3/s. The total length of the canal was more than 300 km to irrigate land in Kyrgyzstan, Tajikistan, and Uzbekistan. In 1953-1962, BFC underwent large reconstruction – two more bays were added and the head flow rate was increased from 100 to 150 m^3/s. By present, all mechanical equipment was replaced along the canal and automated water measurement was implemented at its headwork. BWO Syrdarya makes effort to keep the headwork of BFC in the state of operation.

The headwork constructed in 1889 to divert water into the Dustlik canal in the middle reaches of the Syrdarya River is still operational. It is called “Old headwork Dustlik”. The structure has 14 bays with vertical lift gates. Its maximum capacity is 130 m^3/s. It represents cultural and historical importance as the structure that was created by engineers more than 125 years ago. In 1948, a new headwork was constructed to divert water for irrigated land in Uzbekistan and Kazakhstan.

Its maximum capacity is 230 m^3/s or 100 m^3/s more than that of the old headwork. The total length is 113 km, whereas it is 67 km in the Republic of Uzbekistan and 46 km in the Republic of Kazakhstan.

WATER AND EDUCATION

The representative of the UNESCO Almaty Cluster Office **N. Kim** showed in the presentation the International Hydrological Programme (UNESCO-IHP) as a platform for water research, education, and capacity building. Water education is considered in the Programme as the key element of water security. The main programme priorities are:

- Enhancement of higher water education;
- Improvement of professional education and training of water engineers;
- Water education for children and youth;

- Raising awareness about water issues with the help of unofficial education (mass media and local communities);
- Education for transboundary water cooperation.

With the help of the UNESCO Almaty Cluster Office a training module on Integrated Water Resources Management was developed and adopted by academic institutions in Kazakhstan.

The principles of innovative system of water education in Russia were highlighted in the presentation of Prof. **D.V.Kozlov**, Vice-Chancellor of the Russian State Agrarian University. To a large extent, development in Russia depends on capability to solve water, land reclamation, and environmental problems in the XXI century.

The key element of development is the human resources, primarily, professionals who are able to deal efficiently with environmental and technological challenges. Irrespective of reforms in the Russian professional education and science sectors and based on international experience, the professional development system for water management and land reclamation should be founded on the following ideas and principles of effective modern education:

- consistent and reasonable public policy in the area of water and land reclamation;
- appropriate institutional, organizational, and financial conditions for adoption of advanced technologies and methods;
- development of education as a part of social development;
- integration of science, education, and industry;
- innovative and future oriented research as a base for preparation of water professionals at present;
- water education should be based on existing framework of higher and secondary education in Russia;
- integrated approach to fostering professionals in water management and land reclamation;
- life-long education.

For implementation of the above listed ideas and principles, an innovative system of water education should be developed. Such system should:

- comprise new forms of institutional, financial, and methodological control in water and land reclamation education, with account of both local tasks and federal priorities;
- correspond to the global level of research and innovations in water management and land reclamation;

- integrate relevant Russia's economic sectors and higher and supplementary educational institutions in order to create and maintain common education standards, form new professional development profiles, and maintain high level of professional skills and knowledge through the active feedback from educational institutions from concerned representatives of Executive and Legislative Authorities, organizations and companies working in water sector and businesses;
- be based on new methods for formation of individual professional profile through student mobility inside the national training system and life-long learning;
- implement remote learning that includes obtaining and transfer of knowledge and skills by means of modern technologies of distant learning and academic mobility of participants;
- allow using academic mobility of lecturers from partner educational institutions, their knowledge and experience, as well as career guidance and material and technical basis of partnering educational institutions for more flexibility of general educational process;
- allow using advanced local and international practices, innovations and newest technologies in training of personnel, including permanent monitoring of labour-market needs, broken down by achieving tasks set in front of educational institutions, and by their correspondence to the needs of water and reclamation complex of Russia;
- adapt basic educational curricula to ever-changing needs of society for operation of water and reclamation complex in whole and of separate regions in part, taking ingot account priorities of the sectors within the "Water Strategy of the Russian Federation for the period until 2020", Federal Target Programme "Development of reclamation of lands in Russia for the period until 2020" and other documents.

Prof. **M.Yu.Kalinin,** Chairman of the Association of river guardians "Eco-Krones" shared the experience in the development of a new training course on integrated water resources management for Master degree students as part of the EU-Tempus Programme. The training manual "Water resources management" (authors: M.Kalinin, Belarus, and F.Stolberg, Ukraine) was prepared within the project. The prepared manual in form of a course of lectures was tested in two Kazakhstan's universities in 2014 – in the Taraz State University named after M.Kh.Dulati (50 hours) and Kyzylorda State University named after Korkyt Ata (70 hours). Later on, the topics on the safety of hydraulic structures (big dams) and environmental problems in the Aral Sea basin were included in this course of lectures as important for the Central Asian region.

Director of the SIC ICWC Kyrgyz branch **N.P.Mamataliev** showed in his presentation the results of work on incorporation of the Integrated Water Resources Management subject into curricula of the Kazakh National Agrarian University named after K.I.Skryabin. This training course was developed on the basis of the IWRM-Fergana Project. The Project was implemented in the regions of Kyrgyzstan, Tajikistan, and Uzbekistan in 2000-2012 with the support of the Swiss Agency for Development and Cooperation.

The representative of ICWC Secretariat **D.Dadobayev** told about the environmental education program undertaken in Tajikistan. The objectives of the program:

- Solve regional priority issues of environmental education;
- Support existing and promote new initiative in the area of environmental education in Central Asia;
- Establish sustainable connections and experience and training materials sharing in environmental education between educational institutions in Central Asia;
- Involve new investment in the implementation of the programmes and projects in the region; develop common approaches and principles of programme formation related to environmental education;
- Develop generally accessible databases for environmental education;
- Develop a network of information, methodological and training centres in the countries of the region;
- Adopt up-to-date teaching aids and manuals on environmental education and education in whole for sustainable development.

GLOBAL CHALLENGES

Deputy Secretary General of the International Network of Basin Organizations (INBO) **E.Tardieu** presented the initiative “Paris Pact on Water and Adaptation to Climate Change in the basins of rivers, lakes and aquifers” led by INBO on the occasion of the COP21 in Paris.

It is well-known that climate change will increasingly affect freshwater. Many of the main food production regions in the world are projected to become more drought-affected. Amount of precipitation will globally increase. The projected increase in air temperature will lead to decreased river runoff. Some very important regions (the Mediterranean, south of Latin America, north of Brazil, west and south of Africa) will become drier. Demographic, economic, and environmental effects of climate change will, probably, be substantial. Therefore, it is very important to adapt the strategies for water resource management in light of such changes.

In this context, the INBO Secretariat initiated the Paris Pact on Water and Adaptation to Climate Change in the basins of rivers, lakes and aquifers. The Pact is

aimed to make stakeholders realize that climate change (is already affecting!) and will affect water governance and that respective strategies and action agenda should be adapted in this context. The Pact has already been signed by more than 322 organizations, among which:

- 34 international organizations and 13 transboundary basin organizations
- 8 regional basin networks of INBO
- 243 main signatories in 54 countries,
- 64 ministries and public and national water agencies

The EECCA NWO Secretariat prepared the Russian version of the Paris Pact and was among the first signatories.

E.A.Simonov from the Rivers without Boundaries Coalition presented the China Program of actions against the system-wide environmental crisis: land degradation, water exhaustion in the north and west, eco-riots of people, and eco-migration from the degradation-affected areas. To fight this crisis, the Law on environmental protection was revised thoroughly in January 2015. In April 2015, the PRC State Council adopted the "10 Measures for Protection of Water" Plan. On September 11, 2015 the State Council and Politburo of the CPC Central Committee approved the Plan consisting of 56 articles. The Plan makes provision for the achievement of environmental security in the country, the improvement of environmental quality, and the enhancement of energy efficiency. However, greening in China has side-effects, such as export of environmental impact to neighbors, outside placement of factories, which location in China is not desirable for any reasons, migration of redundant labor forces from agricultural, forestry and other sectors.

The Chinese water policy is also expected to change. Earlier, China preferred not to discuss the protection and use of shared rivers with its neighbors, while, with the growth of investments in the production capacity of riparian countries, this policy could change. This is indicated by the fact that 12 Chinese officials came to the Meeting of the Parties of the UNECE Water Convention in November 2015 as compared to 0-1 representatives at the past meetings.

COOPERATION IN THE CENTRAL ASIAN REGION

The Board Chairman of the Kazgiprovodkhoz Institute **A.D.Ryabtsev** presented the evolution of international water organizations (IFAS, ICWC) in the region. The contributing factors of transboundary water cooperation in Central Asia are:

- **economic**: difference in economic development of the countries; different priorities in foreign trade; uncoordinated tariff policy when settling accounts for energy resources and their transportation; lack of a mechanism, in agreements,

for compensation of damage by the parties resulted from non-fulfillment of obligations when water availability changed, etc.;

- **natural**: the effects of global climate change will be particularly prominent in the region under conditions of arid climate;
- **anthropogenic**: rapid population growth, industrial and agricultural pollution, water pollution and losses, still old technologies applied in irrigated farming, etc.;
- **unavoidable growth of water consumption by Afghanistan** under achievement of certain political stability would result in reduced water availability in the lower reaches of Amudarya River.

The Regional water strategy (RWS) was elaborated within the first Aral Sea Basin Program (ASBP) to reconcile national requirements and rights for water for the long-term with the regional requirements of aquatic ecosystem conservation.

At the current stage of relations between the Central Asian countries, new RWS need to be elaborated to incorporate institutional, legal, financial, managerial, and technological mechanisms.

At the national level, those include but not limited to:

- Adoption of measures for water saving and efficient water use in economic sectors and preservation and development of natural aquatic ecosystems that are equivalent of sectors of the economy.
- Reconstruction and rehabilitation of water infrastructure to increase water productivity.
- Reduction of unit water use in industry, agriculture, and energy sectors.
- Application of up-to-date water treatment and water conservation technologies, as well as waterless technologies, and incentives for their widespread use.
- Modernization of old and construction of new gauging stations to improve water measurement and monitoring.
- Better water financing with involvement of external and internal investments.
- Training of qualified water engineers, conducting research and long-term scientific programmes.

At the regional level, those include but not limited to:

- Initiation of IWRM implementation on a regional scale in Central Asia and determining working steps and tools.
- Reformation of national water laws and water agencies in CA countries for their harmonization and coordination.
- Development and signing of a common ‘institutional’ agreement to replace current numerous regional legal acts, provisions, rules, and procedures.

- Possible establishment of a new regional Cooperation Organization for the Aral Sea Basin (COASB) instead of IFAS.
- Potential establishment of the International Water and Energy Consortium as a mutually acceptable market-driven mechanism in the water-energy field.

For COASB, the following perspectives for future vision and its missions are defined:

- Future vision for the Aral Sea basin: economically prosperous, socially justice and ecologically safe region.
- Future vision for the regional organization: financially stable international organization compliant with worldwide standards that serves the states of the region to achieve the future vision for the Aral Sea basin.

O.I.Eshtchanov (IFAS Executive Committee) presented the monitoring results of the third Aral Sea Basin Program (ASBP-3). This monitoring was prepared on the basis of the information submitted by IFAS founding states, international and donor organizations and indicated to a growth in number and budget of ASBP-3 Projects over 2011-2015, as well as the changes made in the list of national and regional projects.

According to monitoring, at present 192 projects are implemented with the total budget of US$ 2,305.25 million.

These projects include 74 regional projects and 118 national projects (US$ 2,141.088 million).

- Republic of Kazakhstan - 7 projects with the budget of US$ 327.415 million,
- Kyrgyz Republic – 22 projects with the budget of US$ 230.51 million,
- Republic of Tajikistan - 19 projects with the budget of US$ 257.464 million,
- Republic of Uzbekistan – 70 projects with the budget of US$ 1,325.699 million.

All IFAS founding states carry out national programs aimed at water conservation, restoration and development of the Priaralie, integrated water resources management, agricultural diversification, etc. Particular attention is paid to the quality and living conditions, development of housing, social and transport and communications infrastructures, construction of modern rural houses, schools and colleges, medical stations, construction and reconstruction of roads. The programs on improvement of reclamation of land are also implemented.

The activity of the intersectoral working group on geo-hazards was presented by senior researcher of the Kazakh Institute of Geography **A.Z.Tairov**. The intersectoral working group (IWG) was formed in Kazakhstan in 2012 within the

framework of the GIZ project "Adaptation to Climate Change through Sustainable Resource Management and Cross-border Cooperation for Disaster Prevention in Central Asia". The IWG comprises 11 organizations in its membership.

The main tasks of IWG:

- expertise on prevention of geo-hazards in Kazakhstan and Central Asia;
- analysis of water-related disasters, elaboration of risk mitigation approaches and their communication to decision makers;
- given the transboundary context, regular coordination of elaborated approaches among the countries.
- establishment of IWG in other CA countries.

IWG Kazakhstan on transboundary monitoring and early warning of geo-hazards has found an optimal work format: regular joint work meetings that bring together representatives of various public agencies and research institutions. In the medium term, given initiative could raise protection of local communities and have a positive effect on interstate agreements.

Finally, the Conference adopted the resolution.

RESOLUTION OF THE INTERNATIONAL CONFERENCE OF EECCA NWO "CULTURAL AND EDUCATIONAL ISSUES RELATED TO WATER MANAGEMENT IN THE EECCA COUNTRIES"

The participants of the International Conference "Cultural and Educational Issues Related to Water Management in the EECCA Countries" met in Almaty on the 9th of February 2016 within the framework of the Network of Water-Management Organizations from Eastern Europe, Caucasus, and Central Asia (EECCA), *have discussed* urgent cultural and educational issues on the four key topics:

- Water and culture;
- Water and civilization;
- Water and ethics;
- Water and education.

The participants *have agreed* that:

- Water is a common social and natural resource, which first must be used for meeting drinking and household needs, nutrition and food production (irrigated agriculture), energy needs, for ensuring health, livelihoods and well-being of population, especially of vulnerable people, for meeting environmental demand, and conserving and developing flora and fauna.
- Water should serve the purpose of mutually beneficial cooperation and by no means should become a cause of conflict. Any meeting of interest related to quantity and quality of water between interested sides should be decided on the base of mutual respect. The principles of international water law should be followed.
- Water is the nature's gift, without which no life is possible on the Earth. Everyone has the right to life and, hence, to natural water. Therefore, in no circumstance, water in the open natural water bodies (oceans, seas, lakes, and rivers) can be considered as a commodity, although it has the economic value.
- Equitable and reasonable access to water for each is an ethic, moral, and legal right guaranteed by the State in quantity, which meets the physical standards and the most advanced technologies.
- Each user must practice water saving by avoiding its wastage, protecting quality of water in the sources from pollution and deterioration, timely covering costs related to water treatment and conveyance in the pipeline network.

While underlining that maintenance of professional community, information exchange and dissemination of best practices through EECCA NWO is of high importance, the participants *high-lighted the following progress of the Network work* in 2015, including:

- issue of Network's information collections and scientific publications (www.eecca-water.net),
- extension of the knowledge base on CAWater-Info portal (www.cawater-info.net/bk/rubricator.htm) as part of the system of uniform tools for implementation of IWRM that are adapted to specific conditions of water management in river basins with different water stresses in arid and semi-arid zones of EECCA countries,
- participation of EECCA NWO members in international events, including in the 13th "EUROPE-INBO 2015" International Conference on the Water Framework Directive Implementation (Thessaloniki, Greece), the 9th International Conference "The Rivers of Siberia and the Far East" (Irkutsk, Russia), the 66th Meeting of the ICID International Executive Council and the 26th European Regional Conference "Innovate to Improve Irrigation Performance" (Montpellier, France), and the 7th Meeting of the Parties of the Convention on the Protection and Use of Transboundary Watercourses and International Lakes (Budapest, Hungary).

The participants *believed it necessary* to make more profound efforts for:

- implementation of the long-term Program aimed at equitable distribution of transboundary water, efficient use of freshwater in economic and social sectors, control of water pollution, and this should become a state duty from ethical and humanistic perspectives and the civil duty of every water user; enhanced exchange of information focused on dissemination of knowledge and best practices accumulated in the EECCA countries;
- training in the key areas contributing to improved water management (IWRM, water use technologies, information-communication systems (ICS), international water law, water diplomacy) in form of both conventional training courses and e-learning;
- development of (regional and national) knowledge hubs for assistance to water users at various hierarchical levels;
- promotion of ethically underpinned management and use of water resources;
- upbringing of future "water leaders" among young professionals (primary focus);
- promotion of Youth Water Parliament;
- involvement of basin organizations in the Network's activity.

In context of the mentioned above, the participants *stressed the necessity* to deepen activity of the Network by:

1. Continuing submitting on regular basis information on national events in the area of water management and information on new publications, software, methodologies and training materials in order to raise awareness among water professionals and encourage water sector development in EECCA.
2. Enhancing cooperation with national focal points of international networks and organizations, such as Global Water Partnership (GWP), International Commission on Irrigation and Drainage (ICID) and others.

The participants *proposed* to organize the next Network's conference in 2017 on the theme "River basin management problems in the context of climate change", including:

- transboundary river basin cooperation,
- sustainable water management and implementation of information-communication technologies (ICT) at basin level,
- adaptation of water management to climate change and anthropogenic impact,
- water-food-hydropower-environment nexus,
- SMART technologies in the water sector,
- water supply and sanitation.

The participants *thanked* UNECE and GWP CACENA for support and assistance provided to the Network, including in organization of this Conference. The

participants thanked the Russian Government for the long standing support of EECCA NWO.

The participants also *appreciated very much* the assistance rendered by the Kazgiprovodkhoz Institute in preparation and organization of the Conference.

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