ANALYSIS OF HYDROLOGICAL CONDITIONS IN THE SYR DARYA AND AMU DARYA RIVER BASINS OVER THE GROWING SEASON 2020

1 Syr Darya River basin

The actual inflow to the upstream reservoirs in the Syr Darya basin (Toktogul, Andizhan, and Charvak reservoirs) was 14.3 km³ or 90% of the forecast and 78% of the norm for the growing season. The total lateral inflow to the Naryn and the Syr Darya (in the reaches up to the Shardara reservoir) was 7.6 km^3, including 1.52 km^3 from the Karadarya River, 0.31 $км^3$ from the Chirchik River, and 5.79 km^3 from collector-drainage flow, CDF (return flow) and small rivers.

By the beginning of the growing season, the upstream reservoirs (Toktogul, Andizhan, and Charvak) have accumulated 12.93 km³. By the end of the growing season, the total capacity in the upstream reservoirs was 16.87 km³, i.e. 3.93 km^3 were diverted from the rivers.

The inflow from the Naryn River to the Toktogul reservoir was 8.68 km^3. This figure almost coincides with the forecast. Water releases from the reservoir were 5.15 km³ or 91% of the volume scheduled (planned) by BWO Syr Darya. Water diversion into the reservoir from the Naryn River amounted to -3.53 km^3, which is 18% more than scheduled by BWO Syr Darya.

Water storage in the Bakhri Tochik reservoir was 3.07 km³ by the beginning of the growing season and 1.68 km³ by the end of the growing season. The inflow to the Bakhri Tochik reservoir and water discharge into the river amounted to 5.13 km³ and 5.52 km³, respectively. Analysis of operation of the Bakhri Tochik reservoir showed that water supply to the reservoir was 1.05 km³ less than planned by BWO Syr Darya, and water releases from the reservoir were 1.13 km³ less than scheduled by BWO Syr Darya. Water losses from the reservoir, calculated by the water balance method, amounted to 0.54 km^3, which almost coincided with the forecast volume.

In the Shardara reservoir, water storage was 4.88 km³ by the beginning of the growing season and 0.83 km³ by the end of the growing season. The inflow to the Shardara reservoir was only 3.12 km³ or 52% of the forecast (this is due to high withdrawal from the Toktogul reservoir as compared to the planned schedule and lower lateral losses than expected); water releases from the reservoir were 5.56 km³, including 4.89 km³ into the river; no water was released into the Arnasay reservoir from the Shardara hydroscheme. The balance discrepancy of the reservoir was -1.61 km^3; which indicates to water losses in the reservoir and perhaps inaccurate accounting of the flow into the reservoir (excessive flow).

According to the Aral-Syrdarya Basin Water Administration's data, the Koksaray reservoir almost have not accumulated water in the growing season. However, 1, 774 Mm^3 were drawn down from April till July.

Water supply to Aral and the Aral Sea region (Karateren GS) amounted to 0.484 km^3 by the data from Kazhydromet and 0.468 km^3, according to BWO Syr Darya and the Committee for Water Resources of the Republic of Kazakhstan. The latter figure was used in the calculations of the channel balance.

The total water withdrawal from the Naryn River and the Syr Darya River was 8.93 km³ or 75% of the limit in the reaches up to the Shardara reservoir. Over the growing season 2020, water withdrawal was 2.9 km^3 less than planned limits approved by the ICWC meeting.

Water withdrawal from the Dustlik canal was 610 Mm^3 for the Republic of Kazakhstan, 141 Mm^3 for the Kyrgyz Republic, 1,455 Mm^3 for the Republic of Tajikistan, and 6,699 Mm^3 for the Republic of Uzbekistan.

Water availability was estimated at 76% for the Republic of Uzbekistan, 69% for the Republic of Kazakhstan, and 57% for the Kyrgyz Republic. Water availability in the Republic of Tajikistan was 76%. It was uneven by state and river reach (Tables 1.1 and 1.4).

Table 1.5 shows water allocation against limits, actual water withdrawal by balancing sites, in % of the total limits and water withdrawals in the basin. The Toktogul-Uchkurgan reach accounts for 38% of the total water withdrawal. That is 5% more than the water allocation limit, while the Bakhri Tochik - Shardara reach - 50% or 8% less than water allocation limit.

The highest shortage of water (% of the limit) was observed in the middle reaches in the Bakhri Tochik - Shardara reservoir reach - 34% (Table 1.4), and compared to the upstream reach, the shortage increased by 33 %.

Analysis of water balance in basin's reservoirs (Table 1.3) has revealed negative balance discrepancy (losses) -2.49 km³ in total, including 0.34 km^3 in the upstream reservoirs (Toktogul, Andizhan, and Charvak), 1.61 km^3 in the Shardara reservoir, and 0.54 km^3 in the Bakhri Tochik reservoir. Open-channel balance discrepancy in the Toktogul-Shardara reach was negative (losses) -1.11 km³ or 8% of regulated Syrdarya runoff in the growing season. In this context, total water losses in the Syr Darya River basin are estimated at 3.6 km^3 (calculated by water balance method). It should be noted that this estimation is given under the assumption that there are no errors in accounting of river flow at the boundaries of the balancing sites; otherwise, water losses can be estimated as lower in volume.

In the lower reaches of the Syr Darya River, runoff utilization was 6.19 km^3 (including water withdrawal, losses, minus lateral inflow).

Table 1.1

Water availability in the Syr Darya River basin countries over the growing season 2020

Water user	Water volume, km^3		Water availability, %	Deficit (-), surplus (+), km^3
	BWO schedule /limit	Actual	Season	Season
1 Total water withdrawal up to the Shardara reservoir	11.83	8.90	75	-2.93
2 By state:				
– *Kyrgyz Republic*	0.25	0.14	57	-0.11
– *Republic of Uzbekistan*	8.80	6.70	76	-2.10
– *Republic of Tajikistan*	1.91	1.45	76	-0.45
– *Republic of Kazakhstan*	0.88	0.61	69	-0.27
3 By river reach				
3.1 Toktogul reservoir – Uchkurgan hydroscheme	3.95	3.34	85	-0.60
of which:				
– *Kyrgyz Republic*	0.16	0.07	46	-0.09
– *Republic of Tajikistan*	0.24	0.10	42	-0.14
– *Republic of Uzbekistan*	3.55	3.17	89	-0.38
3.2 Uchkurgan hydroscheme-Bakhri Tochik reservoir	1.08	1.07	99	-0.01
of which:				
– *Kyrgyz Republic*	0.08	0.07	79	-0.02
– *Republic of Tajikistan*	0.45	0.51	114	0.06
– *Republic of Uzbekistan*	0.54	0.49	90	-0.06
3.3 Bakhri Tochik reservoir-Shardara reservoir	6.81	4.49	66	-2.31
of which:				
– *Republic of Kazakhstan*	0.88	0.61	69	-0.27
– *Republic of Tajikistan*	1.22	0.84	69	-0.38
– *Republic of Uzbekistan*	4.71	3.04	65	-1.67
4 In addition:				
– Inflow to the Shardara reservoir	6.44	3.12	48	-3.32
– Discharge into the Arnasay	0.00	0.00		0.00
– Supply to the Aral Sea and Aral Sea region[1]	1.05	0.47	45	-0.58

[1] Committee for Water Resources of the Republic of Kazakhstan

Table 1.2

Syr Darya River channel water balance in the growing season 2020

Channel balance item	Water volume, km^3		Disrepancy (actual-plan)	
	Forecast/ plan	Actual	km^3	%
1 Inflow to the Toktogul reservoir	8.66	8.68	0.02	0
2 Lateral inflow to the river reach of Toktogul reservoir – Shardara reservoir (+)	9.78	7.59	-2.18	22
of which:				
– *Discharge from the Karadarya river*	1.54	1.52	-0.02	1
– *Discharge from the Chirchik river*	0.89	0.31	-0.58	65
– *Lateral inflow from CDF and small rivers*	7.35	5.76	-1.59	22
3 Flow regulation in the reservoirs: inflow (+) or withdrawal (-)	-2.52	-3.14	-0.62	25
of which:				
– *Toktogul reservoir*	-2.98	-3.53	-0.55	18
– *Bakhri Tochik reservoir*	0.46	0.39	-0.07	16
4 Regulated runoff (1+2+3)	15.91	13.13	-2.78	17
5 Water withdrawal in the Toktogul – Shardara reach (-)	-11.83	-8.90	2.93	25
6 Discrepancy: water losses (-) or unrecorded inflow to the river channel (+) in the Toктogul-Shardara reach	2.36	-1.11	-3.47	147
Including % of regulated runoff	15	8		
7 Inflow to the Shardara reservoir	6.44	3.12	-3.32	52
8 Water releases from the Shardara reservoir (into the river and water withdrawal)	9.52	5.56	-3.96	42
9 Flow regulation in the Koksaray reservoir: inflow (+) or withdrawal (-)	1.68	1.76	0.08	5
10 Runoff utilization (water withdrawal-lateral inflow+losses) (-)	-9.35	-6.19	3.17	34
11 Supply to the Aral Sea and Aral Sea region	1.05	0.47	-0.58	55

Table 1.3

Water balance of the Syr Darya River basin reservoirs in the growing season 2020

Water balance item	Water volume, km^3		Discrepancy (actual-plan)	
	Forecast/ plan	Actual	km^3	%
1.Toktogul reservoir				
1.1 Inflow to the reservoir	8.66	8.68	0.02	0
1.2 Water volume in the reservoir:				
– beginning of the season (1 April 2020)	11.64	11.64	0.00	0
– end of the season (1 October 2020)	14.61	15.20	0.59	4
1.3 Water releases from the reservoir	5.68	5.15	-0.52	9
1.4 **Discrepancy:** unrecorded inflow (+) or water losses (-)	-0.01	0.04	0.05	
% of inflow to the reservoir	0	0	0	
1.5 **Flow regulation:** inflow (+) or withdrawal (-)	-2.98	-3.53	-0.55	18
2. Andizhan reservoir				
2.1 Inflow to the reservoir	2.08	1.20	-0.88	42
2.2 Water volume in the reservoir:				
– beginning of the season (1 April 2020)	0.82	0.82	0.00	0
– end of the season (1 October 2020)	0.73	0.38	-0.35	48
2.3 Water releases from the reservoir	2.17	1.61	-0.56	26
2.4 **Discrepancy:** unrecorded inflow (+) or water losses (-)	0.00	-0.03	-0.03	
% of inflow to the reservoir	0	2	2	
2.5 **Flow regulation:** inflow (+) or withdrawal (-)	0.09	0.41	0.32	
3. Charvak reservoir				
3.1 Inflow to the reservoir	5.18	4.40	-0.78	15
3.2 Water volume in the reservoir:				
– beginning of the season (1 April 2020)	0.47	0.47	0.00	0
– end of the season (1 October 2020)	1.70	1.28	-0.42	25

Water balance item	Water volume, km^3		Discrepancy (actual-plan)	
	Forecast/ plan	Actual	km^3	%
3.3 Water releases from the reservoir	3.95	3.24	-0.71	18
3.4 **Discrepancy:** unrecorded inflow (+) or water losses (-)	0.0	-0.35	-0.35	
% of inflow to the reservoir	0	8	8	
3.5 **Flow regulation:** flow inflow (+) or withdrawal (-)	-1.23	-1.16	0.07	5
4 Bakhri Tochik reservoir				
4.1 Inflow to the reservoir	6.19	5.13	-1.05	17
4.2 Lateral inflow	0.30	0.18	-0.12	41
4.3 Water volume in the reservoir:				
– beginning of the season (1 April 2020)	3.07	3.07	0.00	0
– end of the season (1 October 2020)	1.75	1.68	-0.07	4
4.4 Water releases from the reservoir	7.25	6.15	-1.09	15
of which*:*				
– *water releases into the river*	6.65	5.52	-1.13	17
– *water withdrawal from the reservoir*	0.60	0.64	0.03	6
4.5 **Discrepancy:** unrecorded inflow (+) or water losses (-)	-0.55	-0.54	0.01	3
% of inflow to the reservoir	9	11	2	
4.6 **Flow regulation:** inflow (+) or withdrawal (-)	0.46	0.39	-0.07	16
5 Shardara reservoir				
5.1 Inflow to the reservoir	6.44	3.12	-3.32	52
5.2 Lateral inflow	0.00	0.00	0.00	
5.3 Water volume in the reservoir:				
– beginning of the season (1 April 2020)	4.88	4.88	0.00	0
– end of the season (1 October 2020)	1.35	0.83	-0.52	38
5.4 Water releases from the reservoir	9.52	5.56	-3.96	42
of which:				
– *Discharge into Arnasay*	0.00	0.00	0.00	

Water balance item	Water volume, km^3		Discrepancy (actual-plan)	
	Forecast/ plan	Actual	km^3	%
– *Water releases into the river*	8.72	4.89	-3.83	44
– *Water withdrawal from the reservoir*	0.80	0.67	-0.13	17
5.5 **Discrepancy:** unrecorded inflow (+) or water losses (-)	-0.45	-1.61	-1.16	
% of inflow to the reservoir	7	52	45	
5.6 **Flow regulation:** inflow (+) or withdrawal (-)	3.08	1.77	-1.31	43
TOTAL flow regulation by reservoirs: inflow (+) or withdrawal (-)	-0.58	-2.12	-1.54	
TOTAL losses (-), unrecorded inflow (+)	-1.02	-2.50	-1.48	

Table 1.5.

Water withdrawal by river reach, % of the total water withdrawal

Balancing site	**Limit**	**Actual**	**Actual-Limit**
Toktogul-Uchkurgan	33	38	5
Uchkurgan-Bakhri Tochik	9	12	3
Bakhri Tochik – Shardara	58	50	- 8

Table 1.4

Country water deficit in the Bakhri Tochik-Shardara reach, growing season 2020

Water balance item		April			May			June			July			August			September			Total for growing season, Mm^3
		I	II	III	I	II	III	I	II	III	I	II	III	I	II	III	I	II	III	
Total water withdrawal in the reach	Limit, m^3/s	288	355	372	351	365	415	530	586	604	672	674	672	567	476	377	204	131	92	**6,806**
	Actual, m^3/s	311	117	239	117	140	198	284	357	362	428	408	452	430	420	368	202	128	140	**4,493**
	Deficit, %	**-**	**67**	**36**	**67**	**62**	**52**	**46**	**39**	**40**	**36**	**39**	**33**	**24**	**12**	**2**	**1**	**3**	**-**	**34**
Kazakhstan	Limit, m^3/s	20	20	10	10	20	40	50	50	60	120	120	120	115	105	100	20	10	0	**878**
	Actual, m^3/s	29	13	15	16	22	27	39	46	46	74	77	80	70	60	51	25	3	0	**610**
	Deficit, %	**-**	**38**	**-**	**-**	**-**	**33**	**23**	**8**	**24**	**39**	**36**	**33**	**39**	**43**	**49**	**-**	**75**	**-**	**31**
Tajikistan	Limit, m^3/s	10	60	81	82	82	89	92	96	96	96	96	96	96	96	82	60	40	35	**1,220**
	Actual, m^3/s	0	0	24	29	45	52	63	72	71	68	76	81	80	76	70	56	50	42	**841**
	Deficit, %	**100**	**100**	**71**	**65**	**46**	**41**	**31**	**25**	**26**	**29**	**21**	**15**	**17**	**21**	**15**	**7**	**-**	**-**	**31**
Uzbekistan	Limit, m^3/s	258	275	281	259	263	286	388	440	448	456	458	456	356	275	195	124	81	57	**4,708**
	Actual, m^3/s	281	104	200	73	73	119	182	239	245	286	255	290	280	284	248	122	76	99	**3,042**
	Deficit, %	**-**	**62**	**29**	**72**	**72**	**59**	**53**	**46**	**45**	**37**	**44**	**36**	**21**	**-**	**-**	**2**	**7**	**-**	**35**

2. Amu Darya River basin

The actual water content in the Amu Darya River at the nominal Atamyrat gauging station (upstream of intake to Garagumdarya) was 38.0 km³ or 8.3 km³ less than expected by BWO Amu Darya (Table 2.2). The inflow to the Nurek HPP amounted to 13.3 km³ and turned to be lower of the forecast by 4.47 km³. Water releases from the reservoir were 9.47 km³ or 4.51 km³ less than scheduled by BWO Amu Darya. Water withdrawal from the river for accumulation in the Nurek reservoir amounted to 3.83 km³. Using the water balance method, a positive discrepancy of 0.62 $km^3$was found. This may be attributed to the unrecorded inflow to the Nurek reservoir and possible inaccurate data on releases from the reservoir (Table 2.3).

According to measurements at the Bir-Ata gauging station, the inflow to the Tuyamuyun hydroscheme (TMHS) was 16.92 km³ or 5.69 km³ less than expected. This did not allow accumulating planned volume of 3.24 km³ in TMHS reservoirs; schedule delay was 0.78 km^3. Water volume in TMHS reservoirs was only 2.46 km³ by the end of the growing season. Water releases from TMHS were 5.55 km^3 less (!) than planned and amounted to 14.15 km³. The balance method determined a negative of 3.12 km^3 discrepancy in the reach Bir-Ata – Tyuyamuyun. This indicates to water losses from TMHS reservoirs and possible inaccurate flow measurement at gauging stations.

Given such hydrological conditions, the established limit of water withdrawal into canals in the Amu Darya River basin was provided by 82% (Table 2.1). The total water withdrawal amounted to 32.5 km³, including 25.67 km³ downstream of the Atamyrat gauging station (starting from intake to Garagumdarya). During the growing season, the average water availability was 88% in the Republic of Tajikistan, 87% in Turkmenistan, and 75% in the Republic of Uzbekistan; in the lower reaches, water availability was 70% in Turkmenistan, 69% in the Republic of Uzbekistan, including 58% in Surkhandarya province.

Water availability decreased from the middle to the lower reaches by 24%, including by 25% in Turkmenistan and by 19% in Uzbekistan. Table 2.1.1 shows the data on ten-day water availability in the lower reaches of the Amu Darya River, which were most affected by uneven distribution of water deficit in the basin.

The Amu Darya River main course balance discrepancy was 3.95 km^3 in the reach Atamyrat GS (nominal) – Bir-Ata GS or about 9% of river runoff at the nominal Atamyrat reach and 2.98 km^3 in the lower reaches (Tuyamuyun GS-Samanbay GS reach) or 30% of river runoff at Tuyamuyun GS.

In general, in the Amu Darya River basin, water balance discrepancy, including channel balance discrepancy and water balance discrepancy of reservoirs, was 9.43 km^3 or about 23% of river runoff at the nominal Atamyrat reach in the growing season.

Water in the amount of 1.04 km^3 was delivered to the Aral Sea region and the Aral Sea during the growing season (Amu Darya River runoff at the Samanbay GS plus discharged collector-drainage water) or 50% of BWO's schedule.

Table 2.1

Water availability in the Amu Darya River basin countries over the growing season 2020

Water user	Water volume, km³		Water availability %	Deficit (-), surplus (+) km³
	Limit/ Schedule	Actual	Season	Season
1. Total water withdrawal	39.67	32.50	82	-7.2
2. By state:				
Kyrgyz Republic	-	-	-	-
Republic of Tajikistan	7.0	6.1	88	-0.8
Turkmenistan	15.5	13.5	87	-2.0
Republic of Uzbekistan	17.2	12.9	75	-4.4
3. Downstream of Atamyrat g/s*)	31.520	25.67	81	-5.9
of which:				
Turkmenistan	15.5	13.5	87	-2.0
Republic of Uzbekistan	16.0	12.2	76	-3.9
4. By river reach:				
Upper reaches	8.152	6.84	84	-1.3
of which:				
Kyrgyz Republic	-	-	-	-
Republic of Tajikistan	6.95	6.14	88	-0.8
Surkhandarya province, Uzbekistan	1.20	0.70	58	-0.5
Middle reaches	16.207	15.04	93	-1.2
of which:				
Turkmenistan	10.47	9.99	95	-0.5
Republic of Uzbekistan	5.73	5.05	88	-0.7
Lower reaches	15.313	10.63	69	-4.7
of which:				
Turkmenistan	5.03	3.52	70	-1.5
Republic of Uzbekistan	10.285	7.11	69	-3.2
5. In addition:				
Emergency and environmental water releases into canals in lower reaches	0	0		
of which:				
Turkmenistan	0	0		
Republic of Uzbekistan	0	0		
Water supply to the Aral Sea region and Aral Sea**	2.10	1.04	50	-1.1

***)** Atamyrat g/s nominal – section of the Amu Darya River upstream of water intake to Garagumdarya

**) including the discharged collector-drainage water

Table 2.1.1

Water availability in provinces in the lower reaches of the Amu Darya River

Month	Ten-day	Dashoguz (Turkmenistan)			Khorezm (Uzbekistan)			Republic of Karakalpakstan		
		Limit, m3/s	Water withdrawal, m3/s	Water availability, %	Limit, m3/s	Water withdrawal, m3/s	Water availability, %	Limit, m3/s	Water withdrawal, m3/s	Water availability, %
April	1	293	176	60	100	85	85	200	193	97
	2	300	148	49	120	64	53	250	138	55
	3	305	212	70	130	136	105	300	196	65
May	1	311	205	66	150	113	75	300	192	64
	2	316	219	69	150	139	93	400	226	57
	3	278	238	86	180	202	112	450	341	76
June	1	268	231	86	210	221	105	500	457	91
	2	297	232	78	250	208	83	600	498	83
	3	304	307	101	300	230	77	650	478	74
July	1	330	345	105	320	260	81	650	511	79
	2	336	290	87	340	220	65	650	395	61
	3	340	259	76	340	192	57	645	328	51
August	1	344	202	59	300	154	51	600	266	44
	2	356	202	57	270	149	55	500	287	57
	3	384	200	52	252	146	58	460	242	53
September	1	369	192	52	190	120	63	300	195	65
	2	304	174	57	170	82	48	200	157	78
	3	287	169	59	144	67	46	100	196	195
Total, Mm^3		5,028	3,518	70	3,450	2,456	71	6,835	4,653	69

Table 2.2

Amu Darya River channel water balance in the growing season 2020

Balance item	Water volume, km^3		Deviation (actual-plan)	
	Forecast /plan	Actual	km^3	%
1. Water content in the Amu Darya River - non-regulated flow at Atamyrat g/s nominal*	46.28	38.00	-8.29	18
2. Flow regulation in the Nurek reservoir: accumulation (+) or withdrawal (-)	-3.78	-3.83	-0.04	1
3. Water withdrawal in the middle reaches (-)	-16.21	-15.04	1.16	7
4. Return flow (collector-drainage) in middle reaches (+)	1.62	1.75	0.12	8
5. Water losses (-) or unrecorded inflow to the river channel (+)	-5.30	-3.95	1.35	25
% of flow at Atamyrat g/s nominal	11	9	-1	
6. River flow at Bir-Ata g/s	22.62	16.92	-5.69	25
7. Releases from Tuyamuyun hydroscheme (including withdrawal from reservoir)	19.69	14.15	-5.55	28
8. Withdrawal in lower reaches, including withdrawal from TMHS (-)	-15.31	-10.63	4.69	31
9 Return flow (collector-drainage) in lower reaches (+)	0.00	0.00	0.00	
10 Emergency and environmental water releases into canals (-)	0.00	0.00	0.00	
11 Flow losses (-) or unrecorded inflow to the channel (+)	-2.88	-2.98	-0.10	4
% of flow at Tuyamuyun g/s	20	30	9.80	
12 Supply to the Aral Sea region and Aral Sea (Samanbay GS)	1.51	0.54	-0.96	64
TOTAL losses:	-8.17	-6.93	1.24	15
% of river water content	18	18		

***** Amu Darya River runoff upstream of the intake to Garagumdarya, taking into account the estimated natural flow at the Nurek HPP (without regulation of the Vakhsh River runoff)**.**

Table 2.3

Water balance of the Amu Darya River basin reservoirs in the growing season 2020

Balance item	Water volume, km^3		Discrepancy (actual-plan)	
	Forecast /plan	Actual	km^3	%
1 Nurek reservoir				
1.1. Inflow to the reservoir	17.77	13.30	-4.47	25
1.2. Water volume in the reservoir:				
– beginning of the season (1 April 2020)	6.13	6.13	0.00	0
– end of the season (1 October 2020)	10.55	10.57	0.02	0
1.3. Water releases from the reservoir	13.98	9.47	-4.51	32
1.4. **Balance discrepancy:** unrecorded inflow (+) or losses (-)	0.64	0.62	-0.02	
% of inflow to reservoir	4	5	1.03	
1.5. **Flow regulation**: accumulation (+) or withdrawal (-)	-3.78	-3.83	-0.04	1
2 TMHS reservoirs				
2.1 Runoff at Bir-Ata g/s	22.62	16.92	-5.69	25
2.2 Water volume in the reservoirs:				
– beginning of the season (1 April 2020)	2.80	2.80	0.00	0
– end of the season (1 October 2020)	3.24	2.46	-0.78	24
2.3 Water releases from the hydroscheme	19.69	14.15	-5.55	28
of which:				
– releases into the river	14.24	9.93	-4.31	30
– withdrawal	5.45	4.22	-1.24	23
2.4 **Balance discrepancy**: unrecorded inflow (+) or losses (-)	-2.49	-3.12	-0.63	25
Including % of inflow to the reservoir	11	18	7	
2.5 **Flow regulation**: accumulation (+) or withdrawal (-)	-8.38	-6.99	1.38	17
TOTAL flow regulation by the reservoirs: accumulation (+) or withdrawal (-)	-12.16	-10.82	1.34	11
TOTAL losses (-), unrecorded inflow (+)	-1.85	-2.50	-0.65	35