

ANALYSIS OF WATER-MANAGEMENT SITUATION IN THE SYRDARYA AND AMUDARYA RIVER BASINS OVER THE GROWING SEASON 2014

1 Syrdarya River Basin

The actual inflow to upstream reservoirs in the Syrdarya basin (Toktogul, Andizhan, and Charvak reservoirs) was 14.366 km³ or 91 % or 101.6% of the forecast and 78 % of the norm during the growing season. The total lateral inflow to the Naryn and Syrdarya rivers (reaches up to Shardara reservoir) was 9.72 km³. By the end of the growing season, 13.817 km³ or 88 % of BWO Syrdarya's scheduled amount were accumulated in upstream reservoirs, including 11.92 km³ in Toktogul reservoir, i.e. 4 km³ less as compared to the same date in 2013. Water releases from the Toktogul reservoir amounted to 4.29 km³ or 105 % of the schedule. The largest amount of 1,102 km³ (126 % of plan) of water was released in April, then in May the amount decreased to 654 km³, and water releases dropped to 590 km³ (98 % of plan) in June. Water releases were 641 km³ in July, increased to 747 km³ (114.7 %) in August and again decreased to 560 km³ (88 %) in September (see Table 1.4, which compares water releases from the Toktogul HPS with water availability in the Toktogul-Uchkurgan reach) and Uchkurgan- Kairakkum.

The total water withdrawal from the Naryn and Syrdarya rivers in the reaches up to Shardara reservoir was 8.66 km³ or 82 % of the quota cut by 10%. During the growing season 2014, 1.9 km³ less water was diverted against the schedule of BWO Syrdarya. Water shortage (against the quota cut by 10%) was 242 Mm³ for the Republic of Kazakhstan, 53 Mm³ for the Kyrgyz Republic, 239 Mm³ for the Republic of Tajikistan, and 1,369 Mm³ for the Republic of Uzbekistan (along the Dustlik canal). Water was distributed unevenly among the states and river reaches (see Table 1.1). This shortage was particularly acute in the river's midstream in Kairakum-Shardara section and reached 23 %. In some ten-day periods water availability of decreased to 42...48 % (July) for the Republic of Kazakhstan, and to 33...37 % (late May-early June) for the Republic of Uzbekistan.

Water availability in the Syrdarya midstream depends on releases of water from the Kairakkum reservoir. Given the inflow of 1,712 Mm³, 1,720 Mm³ (or 113.5 % of BWO's schedule) were released from the reservoir in April, 1,112 Mm³ in May, and 1,003 Mm³ (77.4 %) in June. The lowest water releases (590 Mm³) from the Toktogul reservoir were observed in June as well; while the inflow to reservoir was maximum (1,880 Mm³). The ten-day analysis of water releases from the Kairakkum reservoir against water availability in the midstream is shown in Table 1.5.

Inflow to the Shardara reservoir was 5.06 km³, while water releases from the reservoir were 7.75 km³, including 6.92 km³ released into the river; water did not reach the Arnasay reservoir. According to Aralo-Syrdarya Basin Water Administration's data, the Koksaray reservoir accumulated water only in April (146 Mm³) and released the earlier accumulated flow in the amount of 2949 Mm³ in other months (May-September).

The analysis of reservoirs' water balances (Table 1.3) indicated to unaccounted inflow to Charvak reservoir in the amount of 0.38 km³. Losses identified for Kairakkum and Shardara reservoirs amounted to 1.42 km³ in total.

According to Kazgidromet's data (at Karateren gauging station), water supply to the Aral Sea and Prearalie amounted to 2.0 km³ during the growing season.

Table 1.1

Water availability in the Syrdarya River basin countries for the growing season 2014

Water user	Water volume, km ³		Water availability, % season	Deficit (-), surplus (+) km ³ season
	BWO schedule / quota *	actual		
1 Total water withdrawal	10.56	8.66	82	-1.90
2 By state:				
- <i>Kyrgyz Republic</i>	0.222	0.1683	76	-0.05
- <i>Republic of Uzbekistan</i>	7.920	6.551	83	-1.37
- <i>Republic of Tajikistan</i>	1.715	1.476	86	-0.24
- <i>Republic of Kazakhstan</i>	0.702	0.460	66	-0.24
3 By river reach				
3.1 Toktogul reservoir-Uchkurgan hydroscheme	3.55	2.99	84	-0.56
<i>of which:</i>				
- <i>Kyrgyz Republic</i>	0.1455	0.0955	66	-0.050
- <i>Republic of Tajikistan</i>	0.2129	0.0751	35	-0.138
- <i>Republic of Uzbekistan</i>	3.1933	2.8238	88	-0.370
3.2 Uchkurgan hydroscheme – Kayrakkum hydroscheme	0.97	1.03	106	0.059
<i>of which:</i>				
- <i>Kyrgyz Republic</i>	0.0763	0.0728	95	-0.004
- <i>Republic of Tajikistan</i>	0.4039	0.5024	124	0.099
- <i>Republic of Uzbekistan</i>	0.4897	0.4539	93	-0.036
3.3 Kayrakkum hydroscheme – Shardara reservoir	6.04	4.63	77	-1.41
<i>of which:</i>				
- <i>Republic of Kazakhstan</i>	0.7022	0.4601	66	-0.24
- <i>Republic of Tajikistan</i>	1.0978	0.8982	82	-0.20
- <i>Republic of Uzbekistan</i>	4.2371	3.2735	77	-0.96
4 In addition:				
- Inflow to the Shardara reservoir	3.94	5.06	129	1.12
- Discharge into Arnasay	0.00	0.00		0.00
- Water supply to the Aral Sea and Priaralie	1.90	2.00	105	0.10

*) Quotas cut by 10% for the growing season 2014

Table 1.2

Syrdarya River channel water balance for the growing season 2014

Balance item	Water volume, km ³		Deviation (actual- plan)
	forecast/plan	actual	
1 Inflow to the Toktogul reservoir	8.64	7.19	-1.45
2 Lateral inflow at the river reach Toktogul reservoir-Shardara reservoir (+)	2.69	9.03	6.35
<i>of which:</i>			
- <i>Release into the Karadarya river</i>	1.47	1.51	0.05
- <i>Release into the Chirchik river</i>	1.22	0.94	-0.28
- <i>Lateral inflow from CDF and small rivers</i>		6.58	6.58
3 Flow regulation in the reservoirs: inflow (+) or diversion (-)	-2.47	-1.44	1.02
<i>of which:</i>			

Balance item	Water volume, km ³		Deviation (actual- plan)
	forecast/plan	actual	
- Toktogul reservoir	-4.51	-2.89	1.61
- Kairakkum reservoir	2.04	1.45	-0.59
4 Regulated flow crok (1+2+3)	8.86	14.78	5.92
5 Water diversion at the reach Toktogul-Shardara (-)	10.56	8.66	-1.90
6 Water losses (-) or unrecorded inflow to the channel (+) at the reach Toktogul-Shardara	5.64	-1.06	-6.70
<i>Including % of the regulated flow</i>	-64	7	
7 Inflow to the Shardara reservoir	3.94	5.06	1.12
8 Flow regulation in the Shardara reservoir: inflow (+) or diversion (-)	2.48	2.68	0.20
9 Water release from the Shardara reservoir into the river	5.22	6.92	1.71
10 Diversion to the Kzylkum canal (-)	1.21	0.82	-0.38
11 Diversion to the Kzylkum canal (-)	0.00	0.00	0.00
12 Water supply to the Aral Sea and Priaralie	1.90	2.00	0.10

Table 1.3

Water balance of the Syrdarya River basin reservoirs for the growing season 2014

Balance item	Water volume, km ³		Deviation (actual-plan)
	Forecast/plan	actual	
1. Toktogul reservoir			
1.1 Inflow to the reservoir	8.637	7.188	-1.45
1.2 Water volume in the reservoir:			
- beginning of the season (April 1, 2014)	9.009	9.009	0.00
- end of the season (October 1, 2014)	13.518	11.921	-1.60
1.3 Release from the reservoir	4.073	4.293	0.22
1.4 Unrecorded inflow (+) or losses (-)	-0.055	0.018	0.073
<i>% of inflow to the reservoir</i>	-0.6	0.2	0.88
1.5 Flow regulation: inflow (+) or diversion(-)	-4.509	-2.894	1.61
2. Andizhan reservoir			
2.1 Inflow to the reservoir	2.461	1.791	-0.67
2.2 Water volume in the reservoir:			
- beginning of the season (April 1, 2014)	0.788	0.788	0.00
- end of the season (October 1, 2014)	0.703	0.392	-0.31
2.3 Release from the reservoir	2.535	2.205	-0.33
2.4 Unrecorded inflow (+) or losses (-)	-0.011	0.018	0.03
<i>% of inflow to the reservoir</i>	-0.4	1.0	1.47
2.5 Flow regulation: inflow (+) or diversion(-)	0.085	0.414	0.33
3. Charvak reservoir			
3.1 Inflow to the reservoir	4.878	5.387	0.51
3.2 Water volume in the reservoir:			
- beginning of the season (April 1, 2014)	0.641	0.591	-0.05
- end of the season (October 1, 2014)	1.437	1.504	0.07
3.3 Release from the reservoir	4.03	4.85	0.82
3.4 Unrecorded inflow (+) or losses (-)	-0.05	0.38	0.42
<i>% of inflow to the reservoir</i>	-0.98	6.99	7.97
3.5 Flow regulation: inflow (+) or diversion(-)	-0.797	-0.537	0.26
3 Kairakkum reservoir			
4.1 Inflow to the reservoir	5.53	5.34	-0.19
4.2 Lateral inflow	0.300	0.231	-0.07
4.3 Water volume in the reservoir:			
- beginning of the season (April 1, 2014)	3.48	3.48	0.00
- end of the season (October 1, 2014)	1.44	1.12	-0.32
4.4 Release from the reservoir	7.36	7.02	-0.35

Balance item	Water volume, km ³		Deviation (actual-plan)
	Forecast/plan	actual	
<i>of which:</i>			
- release to the river	6.93	6.66	-0.27
- water diversion from the reservoir	0.433	0.357	-0.076
4.5 Unrecorded inflow (+) or losses (-)	-0.50	-0.91	-0.40
<i>% of inflow to the reservoir</i>	-9.1	-17.0	-7.89
4.6 Flow regulation: inflow (+) or diversion(-)	2.042	1.45	-0.59
5 Shardara reservoir			
5.1 Inflow to the reservoir	3.94	5.06	1.12
5.2 Lateral inflow	0.0	0.0	0.00
5.3 Water volume in the reservoir:			
- beginning of the season (April 1, 2014)	4.127	4.127	0.00
- end of the season (October 1, 2014)	1.117	0.933	-0.18
5.4 Release from the reservoir	6.42	7.75	1.33
<i>of which:</i>			
- Discharge into Arnasay	0.00	0.00	0.000
- Release to the river	5.22	6.92	1.71
- water diversion from the reservoir	1.21	0.82	-0.38
5.5 Unrecorded inflow (+) or losses (-)	-0.53	-0.51	0.02
<i>% of inflow to the reservoir</i>	-13.4	-10.1	3.32
5.6 Flow regulation: inflow (+) or diversion(-)	2.48	2.68	0.20
TOTAL flow regulation by reservoirs:			
inflow (+) or diversion (-)	-0.70	1.12	1.82
TOTAL losses (-), unrecorded inflow (+)	-1.14	-1.00	0.14

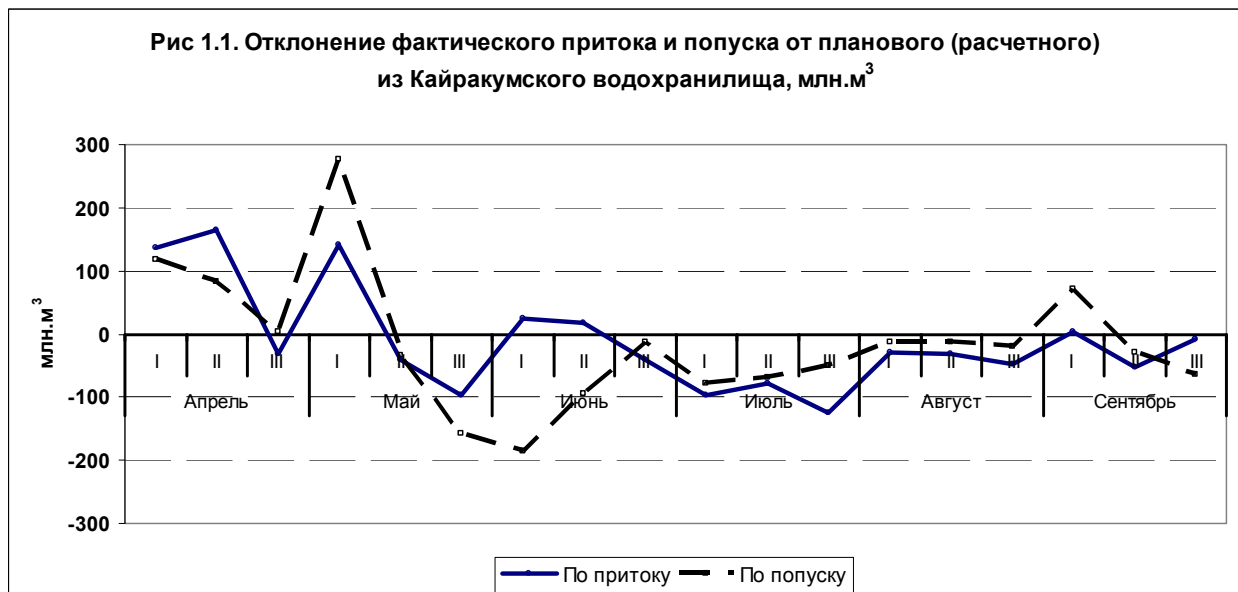


Figure 1.1. Deviation of actual inflow and releases from planned (design) values in Kairakkum reservoir, Mm³

Positive values (+) of deviation of actual inflow from planned out indicate to unrecorded inflow, while negative values (-) indicate to non-fulfillment of obligations to ensure inflow to reservoir and (or) to unrecorded losses (water diversion). Negative values (-) of deviation of actual releases from the reservoir from planned ones mean failure to observe accords on water releases.

Table 1.4

Ten-day analysis of water releases from the Toktogul reservoir and water availability (W/A) in the Toktogul-Kairakkum reach in 2014

Reach	Repub lic	Indicators	April			May			June			July			Agust			September			Grow. season Mm ³
			I	II	III	I	II	III	I	II	III	I	II	III	I	II	III	I	II	III	
Release from Toktogul reservoir		Plan, m ³ /s	337	337	337	252	252	252	232	232	232	238	238	238	243	243	243	245	245	245	4073
		Actual, m ³ /s	451	468	356	240	241	251	222	220	241	241	243	234	367	303	177	184	206	258	4293
		Actual/Plan %	<i>134</i>	<i>139</i>	<i>106</i>	<i>95</i>	<i>95</i>	<i>100</i>	<i>96</i>	<i>95</i>	<i>104</i>	<i>101</i>	<i>102</i>	<i>98</i>	<i>151</i>	<i>125</i>	<i>73</i>	<i>75</i>	<i>84</i>	<i>105</i>	<i>105</i>
Toktogul-Uchkurgan	Uzb	Quota, m ³ /s	134	158	178	200	190	190	210	228	242	270	284	280	260	222	193	152	120	119	3193
		Actual, m ³ /s	158	170	188	194	208	200	172	220	237	146	226	153	182	197	164	147	127	128	2824
		W/A, %	<i>118</i>	<i>108</i>	<i>105</i>	<i>97</i>	<i>109</i>	<i>105</i>	<i>82</i>	<i>97</i>	<i>98</i>	<i>54</i>	<i>80</i>	<i>55</i>	<i>70</i>	<i>89</i>	<i>85</i>	<i>97</i>	<i>106</i>	<i>107</i>	<i>88</i>
	Taj	Quota, m ³ /s	9.9	11.7	12.6	13.5	14.4	14.4	15.3	15.3	15.3	15.3	15.3	15.3	15.3	15.3	13.5	11.7	9.9	8.1	212.9
		Actual, m ³ /s	3.7	8.9	3.5	6.7	6.9	4.0	2.1	4.4	7.1	2.4	2.9	7.2	7.8	7.2	5.8	2.3	1.9	0.6	75.1
		W/A, %	<i>36.9</i>	<i>76.2</i>	<i>27.7</i>	<i>49.3</i>	<i>47.9</i>	<i>27.4</i>	<i>13.5</i>	<i>29.0</i>	<i>46.3</i>	<i>15.9</i>	<i>19.0</i>	<i>47.2</i>	<i>50.7</i>	<i>47.2</i>	<i>42.7</i>	<i>19.7</i>	<i>18.9</i>	<i>7.3</i>	<i>35.3</i>
	Kyrg	Quota, m ³ /s	3.2	4.0	4.0	5.7	6.8	9.2	11.6	11.3	12.3	13.2	13.2	13.9	13.1	11.9	11.5	8.3	6.6	5.2	145.5
		Actual, m ³ /s	2.0	2.5	3.5	3.8	4.1	4.7	6.8	8.1	9.5	9.6	9.6	8.4	7.4	7.0	6.9	5.0	4.8	4.8	95.5
		W/A, %	60.2	63.1	88.4	67.0	61.3	51.6	58.6	71.2	77.4	72.6	72.6	60.3	56.2	58.8	59.9	60.7	73.1	92.0	65.6
Uchkurgan-Kairakkum	Uzb	Quota, m ³ /s	22.4	23.4	23.5	24.3	24.3	25.2	30.6	33.5	36.0	45.7	50.4	50.4	46.8	38.0	27.1	22.5	18.9	13.5	489.7
		Actual, m ³ /s	32.1	29.8	31.7	26.9	23.8	24.8	28.7	29.6	30.7	29.5	33.9	36.1	36.8	34.9	27.3	22.7	19.5	17.6	453.9
		W/A, %	<i>143.3</i>	<i>127.4</i>	<i>134.9</i>	<i>110.9</i>	<i>97.9</i>	<i>98.2</i>	<i>93.8</i>	<i>88.4</i>	<i>85.3</i>	<i>64.5</i>	<i>67.2</i>	<i>71.6</i>	<i>78.6</i>	<i>91.9</i>	<i>101</i>	<i>101</i>	<i>103</i>	<i>131</i>	<i>92.7</i>
	Taj	Quota, m ³ /s	0	11	20	24	24	29	33	38	38	38	38	32	32	29	23	18	17	15	404
		Actual, m ³ /s	0	0	6	37	36	38	39	40	43	44	41	40	42	39	38	36	28	22	502
		W/A, %		<i>0</i>	<i>33</i>	<i>153</i>	<i>147</i>	<i>133</i>	<i>118</i>	<i>107</i>	<i>113</i>	<i>116</i>	<i>109</i>	<i>125</i>	<i>134</i>	<i>135</i>	<i>160</i>	<i>201</i>	<i>161</i>	<i>145</i>	<i>124</i>
	Kyrg	Quota, m ³ /s	2.5	2.5	3.4	4.1	4.1	4.1	5.4	5.4	5.7	6.8	6.8	5.9	5.7	5.7	5.1	5.1	4.5	4.1	76.3
		Actual, m ³ /s	0.0	0.0	0.5	4.7	5.2	5.2	5.5	5.7	5.6	5.2	6.1	5.8	6.0	5.4	5.9	6.0	5.3	4.6	72.8
		W/A, %	<i>0.0</i>	<i>0.0</i>	<i>15.2</i>	<i>115.3</i>	<i>128.9</i>	<i>128</i>	<i>102</i>	<i>105.9</i>	<i>98.4</i>	<i>75.3</i>	<i>89.2</i>	<i>98.1</i>	<i>106</i>	<i>95</i>	<i>114</i>	<i>116</i>	<i>118</i>	<i>113</i>	<i>95.4</i>

Table 1.5

Ten-day analysis of water releases from the Kairakkum reservoir and water availability (W/A) in the Kairakkum-Shardara reach in 2014

Republic	Indicator	April			May			June			July			August			September			Grow. season Mm ³
		<i>I</i>	<i>II</i>	<i>III</i>	<i>I</i>	<i>II</i>	<i>III</i>	<i>I</i>	<i>II</i>	<i>III</i>	<i>I</i>	<i>II</i>	<i>III</i>	<i>I</i>	<i>II</i>	<i>III</i>	<i>I</i>	<i>II</i>	<i>III</i>	
Releases from Kairakkum reservoir	Plan, m ³ /s	585	585	585	384	384	384	500	500	500	500	500	500	413	413	413	250	250	250	6932
	Actual, m ³ /s	721	681	589	703	343	219	286	390	485	410	419	446	397	399	392	333	216	177	6662
	Actual/Plan %	<i>123</i>	<i>116</i>	<i>101</i>	<i>183</i>	<i>90</i>	<i>57</i>	<i>57</i>	<i>78</i>	<i>97</i>	<i>82</i>	<i>84</i>	<i>89</i>	<i>96</i>	<i>97</i>	<i>95</i>	<i>133</i>	<i>86</i>	<i>71</i>	<i>96</i>
Uzb	Quota, m ³ /s	217	226	240	242	245	266	356	401	401	405	405	405	333	261	189	107	71	48	4237
	Actual, m ³ /s	196	133	274	312	243	87	131	210	293	276	253	278	237	234	187	164	124	101	3274
	W/A, %	<i>90</i>	<i>59</i>	<i>114</i>	<i>129</i>	<i>99</i>	<i>33</i>	<i>37</i>	<i>52</i>	<i>73</i>	<i>68</i>	<i>62</i>	<i>69</i>	<i>71</i>	<i>90</i>	<i>99</i>	<i>153</i>	<i>174</i>	<i>209</i>	<i>77</i>
Taj	Quota, m ³ /s	9	54	73	74	74	80	83	86	86	86	86	86	86	86	74	54	36	32	1098
	Actual, m ³ /s	0	0	7	50	69	63	70	77	78	78	81	85	77	75	75	57	39	34	898
	W/A, %	<i>0</i>	<i>0</i>	<i>10</i>	<i>68</i>	<i>94</i>	<i>78</i>	<i>85</i>	<i>89</i>	<i>90</i>	<i>91</i>	<i>94</i>	<i>98</i>	<i>90</i>	<i>87</i>	<i>102</i>	<i>106</i>	<i>107</i>	<i>109</i>	<i>82</i>
Kaz	Quota, m ³ /s	14	14	14	14	18	18	45	54	72	81	90	90	90	90	72	21	0	0	702
	Actual, m ³ /s	16	12	14	17	20	26	26	29	35	34	43	50	45	50	50	39	13	4	460
	W/A, %	<i>116</i>	<i>87</i>	<i>102</i>	<i>124</i>	<i>109</i>	<i>145</i>	<i>58</i>	<i>53</i>	<i>48</i>	<i>42</i>	<i>48</i>	<i>56</i>	<i>50</i>	<i>56</i>	<i>69</i>	<i>186</i>			<i>66</i>

2 Amudarya River Basin

The actual water availability along the Amudarya River in the Atamyrat gauging station (upstream of intake to Garagumdarya) was 41.52 km³ or 1.42 km³ less than expected by BWO Amudarya schedule (see Table 2.2). Inflow to Nurek HPP turned to be higher by 0.29 km³ than the forecast and water releases from the reservoir were 12.46 km³ or 0.21 km³ more than planned amount. Water releases from the Nurek reservoir amounted to 1.064 km³ (or 101% of plan) in April, 2.78 km³ (128 %) in May, 3.41 km³ (88.5%) in June, 4.46 km³ (101 %) in July, 3.18 km³ (85 %) in August, and 1.91 km³ (113 %) in September. Withdrawal of river flow at the expense of accumulation in the Nurek reservoir amounted to 4.37 km³.

Under such water-related situation, the established quotas of water withdrawals into canals in the Amudarya River basin were 87.5% used; the total water withdrawal was 34.44 km³, including 27.83 km³ downstream of Atamyrat gauging station (starting from intake to Garagumdarya). Water withdrawals were met 82 % in Tajikistan, 89 % in Turkmenistan, and 87 % in Uzbekistan, whereas the lower reaches of Uzbekistan received 86% of water and the Surkhandarya province - 78% (Table 2.1).

Water losses, calculated by balance method, along the Amudarya river from the Atamyrat gauging station to inflow point to Tuyamuyun hydroscheme were 6.56 km³ or 16% of the flow in the Atamyrat section. Water losses from the inflow point to Tuyamuyun hydroscheme to the point of water delivery to the Aral Sea and Prearalie were 1.19 km³ or 7% of inflow to Tuyamuyun hydroscheme.

Through flow to Samanbay gauging station plus discharge of collector-drainage water, 2.82 km³ of water were delivered to Prearalie and the Aral Sea during the growing season.

Table 2.1

Water availability in the Amudarya River Basin countries for the growing season 2014

Water user	Water volume, km ³		Water availability, %	Deficit (-), surplus (+) km ³
	Quota/ Schedule	Actual	Season	Season
1. Total water withdrawal	39.6	34.4	86.9	-5.2
2. By state:				
Kyrgyz Republic	-	-	-	-
Republic of Tajikistan	6.9	5.7	82.4	-1.2
Turkmenistan	15.5	13.8	89.2	-1.7
Republic of Uzbekistan	17.2	14.9	86.8	-2.3
3. Downstream of Atamyrat GS *)	31.5	27.8	88.3	-3.7
<i>of which:</i>				
<i>Turkmenistan</i>	15.5	13.8	89.2	-1.7
<i>Republic of Uzbekistan</i>	16.0	14.0	87.4	-2.0
4. By river reach:				
Upstream	8.1	6.6	81.7	-1.5
<i>of which:</i>				
<i>Kyrgyz Republic</i>	-	-	-	-
<i>Republic of Tajikistan</i>	6.9	5.7	82.4	-1.2
<i>Surkhandarya province, Uzbekistan</i>	1.2	0.9	78.0	-0.3
Midstream	16.2	14.6	90.0	-1.6
<i>of which:</i>				
<i>Turkmenistan</i>	10.5	9.4	89.7	-1.1
<i>Republic of Uzbekistan</i>	5.7	5.2	90.6	-0.5
Downstream	15.3	13.2	86.4	-2.1
<i>of which:</i>				
<i>Turkmenistan</i>	5.0	4.4	88.0	-0.6
<i>Republic of Uzbekistan</i>	10.3	8.8	85.6	-1.5

Water user	Water volume, km3		Water availability, %	Deficit (-), surplus (+) km3
	Quota/Schedule	Actual		
5. In addition:				
Emergency and environmental releases to canals within lower reaches	0.0	0.0		
<i>of which:</i>				
<i>Turkmenistan</i>	0.0	0.0		
<i>Republic of Uzbekistan</i>	0.0	0.0		
Water supply to the Aral Sea and Priaralie **	2.1	2.8	134.1	

*) Atamyrat gauging station – located upstream of the water intake to Garagumdarya along the Amudarya

**) Taking into account CDF

Table 2.2

The Amudarya River channel water balance for the growing season 2014

Статьи руслового баланса	Water volume, km3		Deviation (actual-plan)
	Forecast/Plan	Actual	
1. Water content of the Amudarya river -non-regulated flow at the Atamyrat GS *	42.94	41.52	-1.42
Flow regulation in the Nurek reservoir:			
2. accumulation (+) or release (-)	-4.27	-4.30	-0.03
3. Water diversion in the midstream (-)	-16.21	-14.59	1.61
4. Midstream return CDF (+)	1.38	1.76	0.39
5. Water losses (-) or unrecorded inflow to the channel (+)	-5.31	-6.56	-1.25
<i>% of the flow at the Atamyrat GS</i>	-12.36	-15.79	-3.42
6 Inflow to the TMHS (Bir-Ata GS)	18.54	17.84	-0.70
Flow regulation at TMHS:			
7 accumulation (+) or release (-)	-0.67	-0.60	0.07
8 Losses (-) in the TMHS reservoirs, lateral inflow (+)	0.00	0.21	0.20
<i>% of inflow</i>	0.02	1.15	1.13
9 Releases from TMHS (including water diversion from the reservoir)	18.42	17.24	-1.18
10 Downstream water diversion, including diversion from TMHS (-)	-15.31	-13.23	2.08
11 Downstream return CDF (+)	0.00	0.00	0.00
12 Emergency and environmental water releases to canals (-)	0.00	0.00	0.00
13 Runoff losses (-) or unrecorded inflow to the channel (+)	-0.46	-1.19	-0.73
<i>% of the flow at the Tuyamuyun downstream</i>	-2.5	-6.9	-4.41
14 Water supply to the Priaralie and Aral Sea	2.10	2.82	0.72
TOTAL losses:	-5.76	-7.54	-1.78
<i>% of water content of the river</i>	-13.42	-18.2	-4.74

* Water content is calculated as the total of the flow at the Kerki section, the Kerki upstream water diversions (without Tajikistan and Surkhandarya province) and the accumulation in the Nurek reservoir

Table 2.3

Water balance of the Amudarya River Basin's reservoirs for the growing season 2014

Balance item	Water volume, km ³		Deviation (actual-plan)
	Forecast/Plan	Actual	
1 Nurek reservoir			
1.1 Inflow to the reservoir	16.51	16.81	0.29
1.2 Water volume in the reservoir:			
- beginning of the season (April 1, 2014)	6.00	6.24	0.24
- end of the season (October 1, 2014)	10.51	10.56	0.05
1.3 Release from the reservoir	12.25	12.46	0.21
1.4 Lateral inflow (+) or water losses (-)	0.24	-0.03	-0.27
<i>In % of the inflow to the reservoir</i>	1.46	-0.19	-1.64
1.5 Flow regulation: accumulation (+) or release (-)	-4.27	-4.35	-0.08
1 TMHS reservoirs			
2.1 Inflow to the TMHS	18.54	17.84	-0.70
2.2 Water volume in the reservoirs:			
- at the beginning of the season (April 1, 2014)	2.66	2.67	0.00
- at the end of the season (October 1, 2014)	3.34	3.47	0.13
2.3 Release from the TMHS	17.87	17.24	-0.63
of which:			
- release into the river	12.85	12.56	-0.30
- water diversion	5.57	4.68	-0.89
2.4 Lateral inflow (+) or water losses (-)	0.00	0.21	0.20
<i>% of the inflow to the reservoir</i>	0.0	1.15	1.1
2.5 Flow regulation: accumulation (+) or release (-)	-0.67	-0.60	0.07
TOTAL flow regulation by the reservoirs: accumulation (+) or release (-)	-4.94	-4.95	-0.01
TOTAL losses (-), unrecorded inflow (+)	0.24	0.17	-0.07

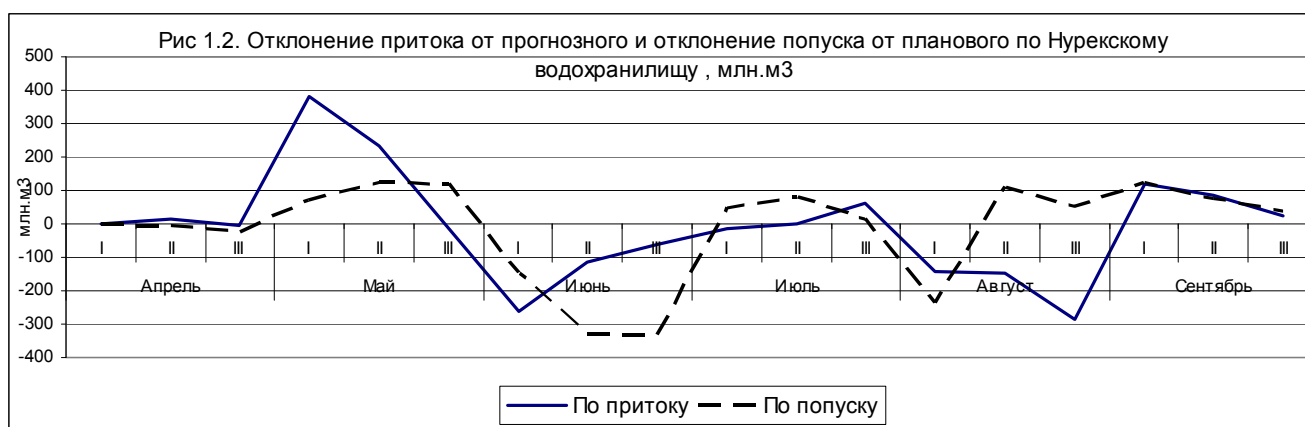


Figure 1.2. Deviation of inflow from forecast and deviation of water releases from plan in Nurek reservoir, Mm³