

**On the matter of study of silting of  
water storages in the Republic of  
Uzbekistan**

№№	Names of provinces and water storages	Designed storage capacity		Actual storage capacity with account of silting		Working storage capacity of water storages under construction	
		total storage	effective storage	total storage	effective storage	total storage	effective storage
1	Andjan	1900	1750	1860	1730		
2	Atchapar	7	6,5			5,0	4,5
3	Assaka-Adyr	3,5	3,0	3,5	3,0		
4	Kuyumazar	306	246	310	260		
5	Shorkul	394	384			170	169
6	Dzhizak	85,0	81,0	80,0	78,0		
7	Zaamin	22,0	21,0			16,0	15,0
8	Naukin	6,0	4,7	6,0	4,7		
9	Karaultebin	53,0	50,0			14,0	11,0
10	Gissarak	170	155			60,0	52,0
11	Dekhkanabad	18,4	15,4	15,0	12,0		
12	Kamashin	25,0	24,0	18,0	17,0		
13	Kyzylsu	20,0	17,0			6,0	3,0
14	Karabag	7,5	6,5	7,5	6,5		
15	Lyangar	7,2	7,1			5,1	5,0
16	Nugali	2,5	2,0	2,0	1,5		
17	Pachkamar	243	236				
18	Tashlaksai	2,0	1,7	2,0	1,7		
19	Chimkurgan	440	418				
20	Shurabsai	2,0	1,7	2,0	1,7		
21	Yangikurgan	3,3	3,0	3,3	3,0		
22	Talimardzhan	1525	1400	1525	1400		
23	Uchkurgan	54,0	37,6				
24	Zarkent	16,0	15,5			1,5	1,0
25	Karasuv	6,2	5,0			3,0	2,6
26	Koksereksai	6,2	5,6	6,2	5,6		
27	Chartak	28,0	26,0			18,0	16,0
28	Irvadam	1,6	1,5	1,6	1,5		
29	Eskier	18,5	16,0	11,0	8,5		
30	Varzyk	18,2	17,8			4,0	3,5
31	Karamurut	2,0	2,0	1,8	1,8		
32	Kattakurgan	900	876	840	820		
33	Karatepa	19,0	18,4	19,0	18,4		
34	Akdarya	170,5	97,5			40,0	30,0
35	Karasui	29,0	22,7			10,0	4,0

At present there are 52 water storages in Uzbekistan with the designed storage capacity of more than 2 mln. m<sup>3</sup>, including 34 operating water storages and 18 ones which are under construction and being designed. The list of water storages is given below in Table 1.

Table 1  
List of water storages of Uzbekistan as it was  
on 1 January 2007, mln. m<sup>3</sup>

Table 1 (continued)

№ №	Names of provinces and water storages	Designed storage capacity		Actual storage capacity with account of silting		Working storage capacity of water storages under construction	
		total storage	effective storage	total storage	effective storage	effective storage	total storage
36	Tusunsai	35,3	30,3			10,0	5,0
37	Khodzhmushkent	8,0	8,0			3,0	3,0
38	Sarmych	4,3	4,0			-	-
39	Aktepa	350	330			100	80,0
40	Degres	12,8	12,0	12,5	11,5		
41	South-Surkhan	641	610				
42	Uchkyzyl	160	80,0	160,	80,0		
43	Tupalang	60,0	3,0	60,0	3,0		
44	Akhangaran	399,0	319,0	399,0	319,0		
45	Tashkent	204,0	195,0	240,0	220,0		
46	Charvak	1991,0	1690,0	1881,0	1580,0		
47	Khodzhikent	30,0	-	30,0	-		
48	Farkhad	350,0	20,0	128,0	12,0		
49	Karkidon	218,4	216,0	210,0	208,0		
50	Kurgantepa	28,6	28,3	20,0	20,0		
51	Shorsui	10,0	9,6			3,0	2,5
52	Tyuyamuyun	7337,0	5270,0	7300,0	5270,0		
	Working storage capacity	18732	14,701	9,084,4	7991,4	442,1	327,1

The biggest water storages of Uzbekistan are used in combination and are designed mainly for irrigation purposes, for power sector and industry. Table 2 demonstrates the main functions and purposes of these water storages use.

It is difficult to assess correctly the current conditions of water storages in Uzbekistan.

First, the observations on the debris flow in rivers are incomplete or scanty which does not provide for assessment of the changes of the effective storage capacity of water storages since the beginning of their operating with the required accuracy.

Second, there are no gauging lines on several rivers for the measurements of discharge of the surface flow inflowing the water storage, including the outflow of sediments or the gauging lines are in the backwater.

Third, the observations of level, filling and regime of water storages are conducted by several authorities and departments defined by their management which hampers the conduction of operative monitoring and comprehensive estimation of the current conditions

Third, after 1985 the soundings of water storages for estimation of the degree of their silting are almost ceased at all.

Water storage	Inflows	Year of putting into operation	Purpose of the water storage use	Area of water table and NESL, km <sup>2</sup>	Storage capacity with NESL, mln. m <sup>3</sup>	Middle depth, m	Highest depth, m
Akhangaran	Akhangaran	1984	Irrigation, seasonal regulation, power sector, industry	8,1	399	49,3	95,5
Tashkent	Akhangaran	1984	Irrigation, seasonal regulation	20,7	204	9,9	30,9
Tyuyamuyun	Amudarya	1979	Irrigation, seasonal regulation, power sector	790	7337	9,2	41,1
South-Surkhan	Surkhandarya	1959	Irrigation, seasonal regulation	2,8	641,0	10,8	28,0
Uzhkyzyl	Surkhandarya	1960	Irrigation, seasonal regulation	10,0	160,0	16,0	40,0
Kamashin	Kashkadarya	1946	Irrigation, seasonal regulation	3,4	25,0	7,4	14,9
Chimkurgan	Kashkadarya	1964	Irrigation, seasonal regulation	45,1	440,0	9,8	27,4
Pachkamar	Kashkadarya	1967	Irrigation, seasonal regulation	12,4	243,0	19,5	34,1
Gissarak	Kashkadarya	1985	Irrigation, seasonal regulation	4,1	170,0	41,5	132
Talimardzhan	Amudarya	1977	Irrigation, seasonal regulation	77,7	1530	19,8	40,0
Kattakurgan	Zeravshan	1954, 1968	Irrigation, seasonal regulation	84,5	845,0	10,0	26,3
Tudakul	Zeravshan	1983	Irrigation, seasonal regulation	225,0	875,0	3,9	12,0

### Main morphometric characteristics of the biggest water storages of Uzbekistan

Table 2

Water storage	Inflows	Year of putting into operation	Purpose of the water storage use	Area of water table and NESL, km <sup>2</sup>	Storage capacity with NESL, mln. m <sup>3</sup>	Middle depth, m	Highest depth, m
Shorkul	Zeravshan	1983	Irrigation, seasonal regulation	17,0	170,0	10,0	14,4
Uchkurgan	Naryn	1961	Irrigation, daily regulation, power	3,7	54,0	14,6	33,4
Andizhan	Karadarya	1970	Irrigation, seasonal regulation, power	60,0	1750,0	29,3	100,0
Karkidon	Kuvasai	1964	Irrigation, seasonal regulation	9,5	218,0	22,9	66,0
Charvak	Chatkal, Pskem, Koksu	1978	Irrigation, seasonal regulation, power	40,3	1991	49,4	148
Khodzhikent	Chirchik	1977	Power, daily regulation	2,5	30,0	12,0	18,5
Gazalkent	Chirchik	1980	Power, daily regulation	1,7	20,0	11,8	15,7
Dzhizak	Sanzar	1962	Irrigation, seasonal regulation	12,5	73,3	56,9	16,4

*NESL - normal effective storage level*

The biggest water storages of Uzbekistan regarding their storage capacity are: Tyuyamuyun, Talimardzhan, Charvak and Andizhan the storage capacity of each being more than 1,5 km<sup>3</sup>. Total storage capacity of all water storages is 18,7 km<sup>3</sup>. This is two times more than the proper water resources of rivers of Uzbekistan which demonstrates their role in the water-management system of Uzbekistan.

The main water resources of Uzbekistan are being formed in mountains where the vegetation is sparse. There are not many forests in the mountains of Central Asia, the mountain-forming rocks and soils are easily washed out. In the foothills the main types of soil are presented with: the loess-like loam, micaceous slate and shale. That is why the rivers are rather turbid, especially, Amudarya, Surkhandarya, Kashkadarya, Zeravshan. Amudarya is one of the not numerous rivers of the world where the water turbidity is 10 kg/m<sup>3</sup>. Sometimes its turbidity reaches 21 ton/m<sup>3</sup>. This results in the intensive silting of water storages. Tyuyamuyun and South-Surkhan water storages are silted very fast. This is clearly manifested on Fig. 1 for Tyuyamuyun water storage and on Fig. 2 – for South-Surkhan water storage. Its storage capacity reduced on 38% during 17 years of its operation.

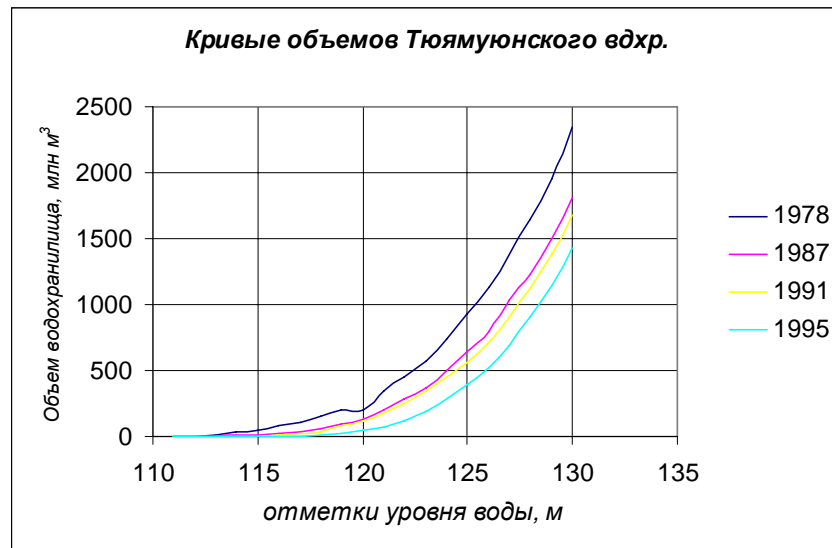


Fig. 1

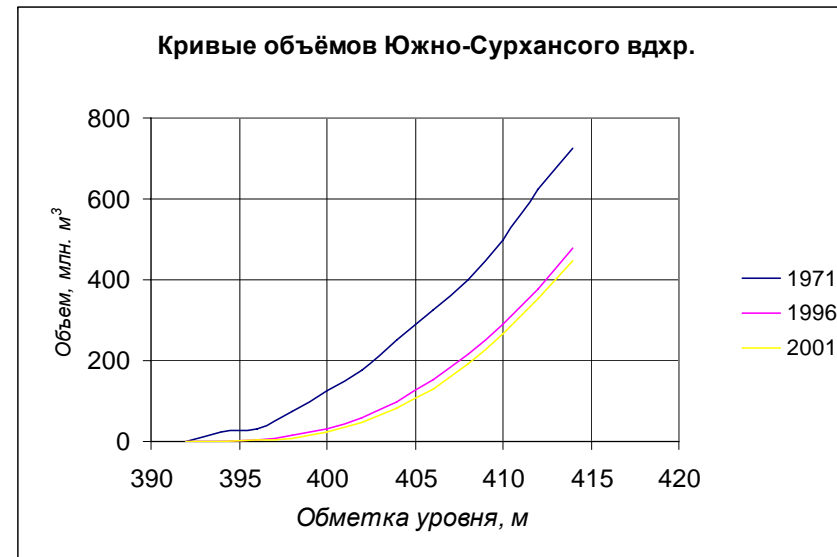


Fig. 2

During 30 years of operation the storage capacity of South-Surkhan water storage reduced also for 30%.

The activities on afforestation of river basins where the water storages are located are not carried out. The washing measures are not practiced for water storages in Uzbekistan as well as their mechanical cleaning. These activities were fulfilled before only in the headraces of the water-intake hydrosystems.