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## **Joint Statement by the President of the Republic of Uzbekistan I. Karimov and the President of the Republic of Kazakhstan N. Nazarbaev**

On March 16-17 of 2010, the President of the Republic of Kazakhstan N. Nazarbaev made an official visit to the Republic of Uzbekistan on the invitation of the President of the Republic of Uzbekistan I. Karimov.

Having extensively discussed the key issues of the Uzbekistan-Kazakhstan relationships development, the existing situation in and around the Central Asian region, as well as topical international problems of mutual concern, then having expressed satisfaction over the level that the inter-state dialogue had reached and having confirmed mutual aspiration for further extension and intensification of all-round cooperation taking into account the national interests and new up-to-date realities, on the basis of the provisions of the Treaty of Eternal Friendship between the Republic of Uzbekistan and the Republic of Kazakhstan dated October 31, 1998, and proceeding from the hystorical and cultural community of the two countries, the Heads of State declare as follows:

1. The Heads of State attach significant importance to the development and further intensification of the dialogue between the Republic of Uzbekistan and the Republic of Kazakhstan at the highest level, frank exchange of views on topical bilateral and multilateral issues, effective coordination and joint search for the solutions that meet the basic interests of both people and are an important factor of regional and interenational stability, as well as sustainable development of the Central Asian region.
2. The Presidents emphasize the aspiration of the two countries for developing the bilateral interaction and successive implementation of the Strategy of Economic Cooperation between the Republic of Uzbekistan and the Republic of Kazakhstan for 2007-2016.
3. Highlighting the positive tendencies in the bilaterial trade, the Parties also announce their intentions to promote the creation of maximum favorable conditions by stimulating mutual investments and inter-bank connections, as well as providing effective cooperation in the development of transit trade and transit communications.

As an example of successive example of regional cooperation, the Parties mention the building and commissioning of the Turkmenistan-Uzbekistan-Kazakhstan-China gas pipeline, which opens a new area in the economic cooperation between the countries of the region and contributes to further strengthening and extension of traditionally good neighbourly relations.

4. Keeping in mind the interests of the national securities, attaching great value to the issues related to ensuring stability in the region, the Parties confirm their

willingness to strengthen the cooperation in fighting against the international terrorism, political, religious, and any other type of extremism, drug traffic, transnational organized crime, illegal arms traffic, and illegal migration on both a bilateral and a multilateral basis within the scope of appropriate international and regional organizations.

To this end, all required measures to improve the interaction between appropriate institutions of Uzbekistan and Kazakhstan shall be taken, including special programs aimed at the prevention of threats and challenges to the stability and security in the region, particularly within the scopes of the Counter-Terrorism Committee under the UN Security Council, SCO Regional Counter-Terrorism Structure, and CIS Counter-Terrorism Center.

5. The Presidents confirm the importance of early peace building and stabilization of the situation in Afghanistan and note the significance of the initiatives to create effective mechanisms aimed to intensify the Afghanistan issues related negotiation process with the participation of the regional countries and international organizations.

6. The Parties note the similarity between the approaches to the settlement of the issues associated with the building and strengthening of the Shanghai Cooperation Organization capacity as an instrument for ensuring stability and security in the region, implementation of large-scale economic projects, including those for the improvement of transportation & communication systems.

The Parties proceed from that the bilateral cooperation in the enhancement of the effectiveness of the SCO priority activities will have positive effect on the activation of its work and rise of the international standing of that Organization.

7. The Presidents discussed the issues related to the range of water-power problems in Central Asia and agreed on the necessity to solve the problems existing in that field, including those related to the construction of new hydropower projects on transboundary rivers in accordance with universally recognized norms of the international law and taking into consideration the interests of all the regional countries.

The Parties noted the necessity for coming to an agreement among all the countries of the region about the ecologic and anthropogenic security issues, as well as maintenance of the water flow balance and regime when building new hydropower projects that have effect on the transboundary level, on the basis of the examination carried out by independent international experts.

8. The Heads of State mentioned the importance of collaboration in humanitarian area, including culture, science, education, cooperation in the field of informatization, development of communication among public institutions, encouragement of cultural and information centers.

9. The Presidents voice confidence that the fruitful negotiations conducted, as well as the bilateral documents signed during the meeting will contribute to further strengthening the traditionally friendly relations between the Republic of Uzbekistan

and the Republic of Kazakhstan, based on good-neighborliness and mutual advantage.

10. The President of the Republic of Kazakhstan N.A. Nazarbaev expressed his gratitude to the President of the Republic of Uzbekistan I.A. Karimov and to the whole Uzbekistan people for the hearty reception and hospitality shown to the Kazakhstan delegation, and invited the President of the Republic of Uzbekistan to visit Kazakhstan at a suitable date. The date of a visit is to be coordinated through diplomatic channels.

I.A. Karimov,  
President of the Republic of Uzbekistan

N.A. Nazarbaev,  
President of the Republic of Kazakhstan

Tashkent, 17 March 2010

*Based on the materials of the Uzbekistan Embassy in China*

## **Analysis of water management situation within the Amudarya and Syrdarya river basins for vegetation period of 2010**

### **1 Syrdarya River Basin**

The actual inflow to the upper reservoirs of the Syrdarya river basin (Toktogul, Andijan, and Charvak) during the vegetation period was  $29.07 \text{ km}^3$ , or 156 % of the inflow expected according to a forecast (design chart of BWO “Syrdarya”). The upper reservoirs took water from the Naryn, Karadarya, and Chirchik rivers with total volume of  $11,123 \text{ km}^3$ , which was greater than the planned by as much as  $3.59 \text{ km}^3$ . However, due to considerable volume of the inflow to the upper reservoirs, the actual discharge from those during the vegetation period came to  $17.84 \text{ km}^3$ , which is greater than the expected volume by 6 %.

The total lateral inflow to the Naryn, Karadarya, Syrdarya, and Chirchik rivers, estimated through the balance method (BWO “Syrdarya” data), was  $13.56 \text{ km}^3$ , and the regulated usable water resource of the basin (that includes the outflows from the upper reservoirs and lateral inflow) came to  $31.4 \text{ km}^3$ .

By the end of the vegetation period,  $22.79 \text{ km}^3$  of water was accumulated in the upper reservoirs, of which  $19.51 \text{ km}^3$ , or 120 % of the planned volume (estimated according to the chart of BWO “Syrdarya”), in the Toktogul reservoir. For reference: by the end of the vegetation period of 2009, there was  $12.67 \text{ km}^3$  of water in the Toktogul reservoir, or by  $6.84 \text{ km}^3$  less than by the beginning of the vegetation period of 2010.

The total water withdrawal from the Syrdarya river came to  $9.47 \text{ km}^3$ , particularly: in the Kyrgyz Republic –  $0.17 \text{ km}^3$ ; in the Republic of Tajikistan –  $1.28 \text{ km}^3$ ; in the Republic of Uzbekistan –  $7.34 \text{ km}^3$ , in the Republic of Kazakhstan (on the Dustlik canal) –  $0.68 \text{ km}^3$ . Besides, there were water discharges to the Arnasay depression in a volume of  $0.13 \text{ km}^3$  and  $4.26 \text{ km}^3$  of water was delivered to the Aral Sea and Aral Sea area (Priaralie).

Water was taken from the stem stream on water consumers’ requests within the limit, proceeding from the actual need for water and availability of water resources. For that reason, in spite of the fact the year was of high water, the design water supply during some ten-day periods was lower than the average value for the season (Table 1.1).

In fact, water was withdrawn less than it was planned according to the limit by  $2.27 \text{ km}^3$  (19 %). Water supply to the countries, river sites was uneven and unstable in time (see Table 2.1 data on the website [www.cawater-info.net/analysis/water/](http://www.cawater-info.net/analysis/water/)).

The obligations on water supply to the Kayrakum reservoir were 260 % fulfilled; water inflow to it came to 12.33 %, while according to the plan schedule it was 4.73 km<sup>3</sup>. The obligations on water supply to the Shardara reservoir were 208 % fulfilled; water inflow to it was 11.59 %.

The release from the Kayrakum reservoir during the vegetation period was 12.89 km<sup>3</sup>, of which 12.39 km<sup>3</sup> to the river. The release from the Shardara reservoir came to 16.25 km<sup>3</sup>, of which 0.13 km<sup>3</sup> was discharged to Arnasay, and 15.34 km<sup>3</sup> – to the Syrdarya river. At that, only 4.26 km<sup>3</sup> of water reached the Aral Sea and Priaralie. Flow use (water withdrawal, losses) at the lower reaches accounted for 11.08 km<sup>3</sup>.

The analysis of the water balance of the reservoirs within the basin (Table 1.3) has detected unaccounted inflow to the Toktogul, Kayrakum, and Shardara reservoirs, the total volume of which was 0.73 km<sup>3</sup>. The losses in the Andijan and Charvak reservoirs came to 0.19 km<sup>3</sup>.

It is noteworthy that the last five years (2005-2006 ... 2009-2010) the average annual inflow to the Toktogul reservoir was 13.5 km<sup>3</sup>, 10.35 km<sup>3</sup> of which during vegetation period. The inflow during the vegetation period of 2010 came to 15.24 km<sup>3</sup>, i.e. it was higher than that for the five years by 4.89 km<sup>3</sup>.

The average volume of the discharge from the Toktogul reservoir during the vegetation periods of the five years accounted for 5.38 km<sup>3</sup>. During the vegetation of 2010, 5.45 km<sup>3</sup> of water was released, which approximated to the average discharge (Table 1.4).

According to our estimates, release of 5-5.5 km<sup>3</sup> water from the Toktogul reservoir during a vegetation period meets the irrigation demands in the basin in high-water years and allows (under steady operation of the Naryn series of hydropower plants) uninterruptedly supplying water to the Fergana Valley canals.

The level of water supply in the Syrdarya midstream depends on the outflow from the Kayrakum reservoir, which even during medium- and high-water periods, operating in the hydropower mode, can limit water supply to the midstream canals.

The actual water discharge from the Kayrakum reservoir during the vegetation period of 2010 exceeded the scheduled discharge almost throughout the period (with the exception of July). The highest excess was in April and May (by 1.8-2.7 times) and September (by 2.4 times). While there was discharge deficit in the second and third ten-day periods of July.

The estimates show that the water availability of the year allowed additional reservoir discharging in July by 0.8-1.0 km<sup>3</sup>, refilling the missing volume of the reservoir in September.

The dynamics of the inflow to the Kayrakum reservoir during the vegetation period of 2010 resembles the water resources situation in 2003-2004, when the inflow to the hydrosystem during the vegetation periods came to 9-8.7 km<sup>3</sup>. However, the vegetation period of 2010 is an extraordinary case in terms of its filling – the reservoir, operating in the power mode over the period, did not discharge less than 3 km<sup>3</sup> of water.

The total channel losses for the vegetation period of 2010 in the Naryn and Syrdarya rivers, on the site up to the Chardarya reservoir, calculated by the balance way (by means of the CAREWIB river channel model) come to about 2.1 km<sup>3</sup>.

These losses, characteristic of high-water years, is compensated by considerable lateral inflow, which includes collector and drainage water, water of small rivers and effluent seepage to the river channels from upstream sites (mainly, downstream the Naryn cascade of hydropower plants, Kayrakum and Farkhad hydrosystems).

The difference between the lateral inflow and losses comes to  $8.2 - 2.1 = 6.1$  km<sup>3</sup>, that virtually equals the volume estimated when planning water allocation in the basin (Table 1.2).

Table 1.1

Indicators of water supply in the Syrdarya river basin countries  
for the vegetation period 2010

Water user	Water volume, km <sup>3</sup>		Level of water supply, %		Deficit (-), surplus (+), km <sup>3</sup>	
	Limit/schedule	Actual	Season	Min for ten-day period*)	Season	Total for ten-day period**)
1. Total water withdrawal	11.74	9.47	81	53	-2.27	-2.55
2. By countries:						
Kyrgyz Republic	0.25	0.17	71	36	-0.08	-0.08
Republic of Uzbekistan	8.80	7.34	84	52	-1.46	-1.7
Republic of Tajikistan	1.90	1.28	67	27	-0.62	-0.64
Republic of Kazakhstan	0.79	0.68	85	53	-0.11	-0.21
3. At sites						
3.1 Toktogul reservoir – Uchkurgan hydraulic site (HS)	3.95	3.01	76	55	-0.94	-0.97
<i>Including:</i>						
<i>Kyrgyz Republic</i>	0.16	0.13	78	41	-0.03	-0.04
<i>Republic of Uzbekistan</i>	0.24	0.13	53	27	-0.11	-0.11
<i>Republic of Tajikistan</i>	3.55	2.75	78	55	-0.8	-0.84
3.2 Uchkurgan HS – Kayrakum HS	1.07	0.98	91	65	-0.09	-0.15
<i>Including:</i>						
<i>Kyrgyz Republic</i>	0.08	0.05	57	21	-0.03	-0.04
<i>Republic of Uzbekistan</i>	0.45	0.36	81	21	-0.09	-0.11
<i>Republic of Tajikistan</i>	0.54	0.57	105	78	0.03	-0.03
3.3 Kayrakum HS – Shardara reservoir	6.72	5.48	82	44	-1.24	-1.48
<i>Including:</i>						
<i>Kyrgyz Republic</i>	0.79	0.68	85	53	-0.11	-0.21
<i>Republic of Uzbekistan</i>	1.22	0.78	64	27	-0.44	-0.44



Water user	Water volume, km <sup>3</sup>		Level of water supply, %		Deficit (-), surplus (+), km <sup>3</sup>	
	Limit/schedule	Actual	Season	Min for ten-day period*)	Season	Total for ten-day period**)
<i>Republic of Tajikistan</i>	4.71	4.02	86	40	-0.69	-0.92
4. In addition:						
Inflow to the Shardara reservoir	5.58	11.59	208	93	6.01	-0.01
Discharge to Arnasay	0.0	0.129	-	-	0.129	-
Delivery to the Aral Sea and Priaralie	2.44	4.26	175	-	1.82	-

\*) Minimum water supply level registered in December.

\*\*\*) Total water deficit for ten-day periods; covered by water surplus within a season.

Table 1.2

#### Syrdarya river channel balance for the vegetation period of 2010

Item of channel balance	Water volume, km <sup>3</sup>		Variance (actual-plan)
	forecast/plan	actual	
1. Inflow to the Toktogul reservoir	10.303	15.244	4.941
2. Lateral inflow at the site Toktogul reservoir–Shardara reservoir (+)	11.458	17.425	5.967
<i>Including:</i>			
<i>Discharge to the Karadarya river</i>	<i>2.21</i>	<i>5.515</i>	<i>3.305</i>
<i>Discharge to the Chirchik river</i>	<i>3.05</i>	<i>3.740</i>	<i>0.69</i>
<i>Lateral inflow through collector &amp; drainage networks and small rivers</i>	<i>6.198</i>	<i>8.17</i>	<i>1.972</i>
3. Control of the reservoir runoff: recharge (+) or withdrawal (-)	-4.433	-9.527	-5.094
<i>Including:</i>			
<i>Toktogul reservoir</i>	<i>-6.683</i>	<i>-9.799</i>	<i>-3.116</i>
<i>Kayrakum reservoir</i>	<i>2.25</i>	<i>0.272</i>	<i>-1.978</i>
4. Regulated runoff (1+2+3)	17.328	23.142	5.814
5. Water withdrawal at the Toktogul-Shardara site (-)	-11.745	-9.470	2.275
6. Streamflow losses (-) or unaccounted flow (+) at the Toktogul-Shardara site	0	-2.085	-2.085
<i>Including % of the regulated runoff</i>	<i>0</i>	<i>9</i>	
7. Inflow to the Shardara reservoir	5.583	11.587	6.004
8. Control of the runoff in the Shardara reservoir: recharge (+) or withdrawal (-)	3.592	4.663	1.071
9. Discharge from the Shardara reservoir to the river	7.97	15.34	7.37
10. Water withdrawal to the Kyzylkum canal (-)	-1.205	-0.780	0.425
11. Discharge to Arnasay (-)	0	-0.13	-0.13
12. Flow consumption at the lower reaches:	-5.53	-11.08	-5.55

Item of channel balance	Water volume, km <sup>3</sup>		Variance (actual-plan)
	forecast/plan	actual	
algebraic sum of water withdrawal (-), lateral inflow (+), and losses (-)			
13. Delivery to the Aral Sea and Priaralie	2.44	4.26	1.82

Table 1.3

Water balance of the Syrdarya river basin reservoirs for the vegetation period of 2010

Item of water balance	Water volume, km <sup>3</sup>		Variance (actual-plan)
	forecast/plan	actual	
<b>1. Toktogul reservoir</b>			
1.1 Water inflow to the reservoir	10.303	15.244	4.94
1.2 Water volume in the reservoir:			
- by the beginning of the season (April 1, 2010)	9.617	9.698	0.08
- by the end of the season (October 1, 2010)	16.245	19.509	3.26
1.3 Release from the reservoir	3.62	5.445	1.83
1.4 Unaccounted inflow (+) or water losses (-)	- 0.055	0.012	0.067
<i>% of the inflow to the reservoir</i>	<i>0.5</i>	<i>0.1</i>	
1.5 Runoff control: recharge (+) or withdrawal (-)	-6.683	-9.799	-3.116
<b>2. Andijan reservoir</b>			
2.1 Water inflow to the reservoir	3.004	6.386	3.38
2.2 Water volume in the reservoir:			
- by the beginning of the season (April 1, 2010)	1.147	1.238	0.09
- by the end of the season (October 1, 2010)	1.15	1.419	0.27
2.3 Release from the reservoir	2.989	6.171	3.18
2.4 Unaccounted inflow (+) or water losses (-)	-0.012	-0.034	-0.022
<i>% of the inflow to the reservoir</i>	<i>0.4</i>	<i>0.5</i>	
2.5 Runoff control: recharge (+) or withdrawal (-)	-0.015	-0.215	-0.2
<b>3. Charvak reservoir</b>			
3.1 Water inflow to the reservoir	5.386	7.441	2.06
3.2 Water volume in the reservoir:			
- by the beginning of the season (April 1, 2010)	0.82	0.8	-0.02
- by the end of the season (October 1, 2010)	1.741	1.858	0.12
3.3 Release from the reservoir	4.45	6.23	1.78
3.4 Unaccounted inflow (+) or water losses (-)	-0.015	-0.153	-0.138
<i>% of the inflow to the reservoir</i>	<i>0.3</i>	<i>2</i>	
3.5 Runoff control: recharge (+) or withdrawal (-)	-0.936	-1.211	-0.275
<b>4. Kayrakum reservoir</b>			
4.1 Water inflow to the reservoir	4.73	12.33	7.6
4.2 Lateral inflow	0.27	0.285	0.01
4.3 Water volume in the reservoir:			

Item of water balance	Water volume, km <sup>3</sup>		Variance (actual-plan)
	forecast/plan	actual	
- by the beginning of the season (April 1, 2010)	3.42	3.52	0.1
- by the end of the season (October 1, 2010)	1.01	3.38	2.37
4.4 Release from the reservoir	6.98	12.89	5.91
<i>Including:</i>			
- discharge to the river	6.5	12.39	5.89
- water withdrawal from the reservoir	0.48	0.49	0.01
4.5 Unaccounted inflow (+) or water losses (-)	-0.16	0.13	0.29
% of the inflow to the reservoir	3	1	
4.6 Runoff control: recharge (+) or withdrawal (-)	2.25	0.272	-1.978
<b>5. Shardara reservoir</b>			
5.1 Water inflow to the reservoir	5.583	11.587	6.004
5.2 Lateral inflow	-	-	-
5.3 Water volume in the reservoir:			
- by the beginning of the season (April 1, 2010)	5.277	5.132	-0.145
- by the end of the season (October 1, 2010)	1.117	1.043	-0.074
5.4 Release from the reservoir	9.175	16.25	7.075
<i>Including:</i>			
- discharge to Arnasay	0	0.13	0.13
- discharge to the river	7.97	15.34	7.37
- water withdrawal from the reservoir	1.205	0.78	0.425
5.5 Unaccounted inflow (+) or water losses (-)	-0.568	0.58	1.148
% of the inflow to the reservoir	10	5	
5.6 Runoff control: recharge (+) or withdrawal (-)	3.592	4.663	1.071
<b>Total</b> runoff control by the reservoirs: recharge (+) or withdrawal (-)	-1.79	-6.29	-4.5
<b>Total</b> losses (-), unaccounted flow (+)	-0.81	0.54	1.35

Table 1.4

Inflow and discharge from the Toktogul reservoir for 2005-2010

Hydrologic year	Inflow, mln. m <sup>3</sup>			Discharge, mln. m <sup>3</sup>		
	Non-vegetation period	Vegetation period	Year	Non-vegetation period	Vegetation period	Year
2005-2006	3496	10362	13858	9082	5418	14500
2006-2007	3157	8911	12068	9538	5857	15395
2007-2008	2505	7371	9876	9726	4408	14134
2008-2009	2672	9876	12548	5884	5748	11632
2009-2010	3898	15244	19142	6965	5445	12410
Average of 5 years	3146	10353	13498	8239	5375	13614

## 2 Amudarya river basin

The actual water content of the Amudarya river at the conventional Atamyrat gauging station (GS) (upstream of water intake to the Garagumdarya river), estimated under the natural discharge of the Vaksh river (without runoff control in the Nurek reservoir), came to 58.31 km<sup>3</sup>, which is more than the expected value by 11.91 km<sup>3</sup>. Out of that volume, 3.79 km<sup>3</sup> was taken to the Nurek reservoir and the actual runoff at the Atamyrat gauging station (upstream of water intake to the Garagumdarya river) came to 54.52 km<sup>3</sup>, which is higher than the expected volume (estimated according to the graph of BWO “Amudarya”) by 30 %.

Under the current water-related situation (high-water year), 88 % of the limit set for water withdrawal to the Amudarya river basin canals was used; total water withdrawal was 34.9 km<sup>3</sup>, of which 28.72 km<sup>3</sup> was taken downstream the Atamyrat gauging station (beginning from the intake point to the Garagumdarya river). Water supply to the countries, river sites was nonuniform and unstable in time (Table 2.1 and data on the website [www.cawater-info.net/analysis/water/](http://www.cawater-info.net/analysis/water/)). Low water supply during some period is accounted, chiefly, for the actual needs for water withdrawal from the river in the high-water year, which are lower than the planned ones for average water years.

The emergency and environmental discharges to the canals at the Amudarya river lower reaches came to 1.57 km<sup>3</sup>, which decreased the actual inflow to Priaralie and the Aral Sea to some extent; the runoff at the Samanbay gauging station was 14.59 km<sup>3</sup>, and taking into account the outflows from the collector & drainage network to Priaralie and the Aral Sea 17.15 km<sup>3</sup> of water, was delivered.

By the end of the season, the Nurek reservoir was re-charged with 10.51 km<sup>3</sup> of water, and the reservoirs of the Tuyamuyun hydrosystem were filled with 5.63 km<sup>3</sup> of water (Table 2.3). Total withdrawal of the river flow due to re-charging the Nurek and Tuyamuyun reservoirs, as well as losses in these reservoirs came to 6.35 km<sup>3</sup>.

The water losses from the Amudarya river, at the site from the Atamyrat gauging station to the Darganata gauging station, estimated based on the balance method (using the CAREWIB river channel balance), came to 3.79 km<sup>3</sup> or 7 % of the flow in the Atamyrat station. In the Tuyamuyun hydrosystem reservoirs, the water losses made up about 14 km<sup>3</sup> (16 % of the flow to the hydrosystem); at the river site from the Tuyamuyun gauging station to the Samanbay gauging station – 5.02 km<sup>3</sup>, or 17 % of the river flow at the Tuyamuyun gauging station (the Tuyamuyun hydrosystem tail-water).

For reference: recommended estimated limits of the Amudarya river channel losses (according to the ADB RETA 6163 Project results) at the site from the Atamyrat gauging station to the Darganata gauging station are 5 %, and at the site from the Tuyamuyun gauging station to the Samanbay gauging station are 20 %. Thus, the excess of the actual losses over the recommended (estimated) is 2 % in the middle reach of the Amudarya river; in the lower reach, the actual losses are lower by 3 % compared to the estimated.

There are no losses in the Nurek reservoir; the balance method has shown an unaccounted inflow with a volume of 0.57 km<sup>3</sup> (3 % of the inflow to the reservoir along the Vakhsh river).

In total, the water losses in the Amudarya river basin came to 10.21 km<sup>3</sup> or 17 % of the river's water content (Atamyrat station).

Table 2.1

Indicators of water supply in the Amudarya river basin countries  
for the vegetation period of 2010

Water user	Water volume, km <sup>3</sup>		Water supply, %		Deficit (-), surplus (+), km <sup>3</sup>	
	Limit/scheduled	Actual	Season	Min for ten-day period*)	Season	Total for ten-day period**)
1. Total water withdrawal	39.5	34.9	88	71	-4.59	-4.92
2. By countries:						
Kyrgyz Republic	-	-	-	-	-	-
Republic of Tajikistan	6.78	5.2	77	57	-1.58	-1.59
Turkmenistan	15.5	13.52	87	72	-1.98	-2.13
Republic of Uzbekistan	17.22	16.18	94	72	-1.04	-1.53
3. Atamyrat GS downstream ***)	31.52	28.72	91	75	-2.8	-3.32
<i>Including:</i>						
<i>Turkmenistan</i>	15.50	13.52	87	72	-1.98	-2.13
<i>Republic of Uzbekistan</i>	16.02	15.2	95	74	-0.82	-1.36
4. At sites:						
Upstream	7.98	6.19	78	57	-1.79	-1.81
<i>Including:</i>						
<i>Kyrgyz Republic</i>	-	-	-	-	-	-
<i>Republic of Tajikistan</i>	6.78	5.2	77	57	-1.58	-1.59
<i>Surkhandarya province, Uzbekistan</i>	1.2	0.99	82	44	-0.21	-0.24
Mid-stream	16.2	14.55	90	80	-1.65	-1.68
<i>Including:</i>						
<i>Turkmenistan</i>	10.46	9.25	89	75	-1.21	-1.24
<i>Republic of Uzbekistan</i>	5.73	5.3	92	79	-0.44	-0.47
Downstream	15.32	14.17	93	61	-1.15	-1.78
<i>Including:</i>						
<i>Turkmenistan</i>	5.04	4.27	85	53	-0.77	-0.89
<i>Republic of Uzbekistan</i>	10.28	9.90	96	60	-0.38	-1.04
5. In addition:						
Emergency and environmental releases to the lower reach canals	0	1.57	-	-	1.57	-
<i>Including:</i>						
<i>Turkmenistan</i>	-	-	-	-	-	-

Water user	Water volume, km <sup>3</sup>		Water supply, %		Deficit (-), surplus (+), km <sup>3</sup>	
	Limit/scheduled	Actual	Season	Min for ten-day period*)	Season	Total for ten-day period**)
<i>Republic of Uzbekistan</i>	0	1.57	-	-	1.57	-
Water supply to Priaralie and the Aral Sea (excluding collector & drainage water)	2.1	14.59	911	-	12.49	-

\*) Minimum of the registered for ten-day periods.

\*\*\*) Total water deficit for ten-day periods; it is covered by the water surplus within the season.

\*\*\*\*) The Atamyrat gauging station taken conventionally: it is Amudarya river station upstream of the water withdrawal to the Garagumdarya river.

Table 2.2

## Amudarya river channel balance for the vegetation period of 2010

Item of channel balance	Water volume, km <sup>3</sup>		Variance (actual-plan)
	Forecast/planned	Actual	
1. Amudarya river's water content: uncontrolled flow at the Atamyrat gauging station (conventional)	46.4	58.31	11.91
2. Nurek reservoir runoff control: recharge (+) or withdrawal (-)	-4.4	-3.84	0.56
3. Water withdrawal at the mid-stream (-)	-16.2	-14.55	1.65
4. Return collector & drainage flow of the mid-stream (+)	1.10	1.73	0.63
5. Flow losses (-) or unaccounted inflow to the channel (+)	0	-3.79	-3.79
<i>% of the runoff at the Atamyrat gauging station (conventional)</i>	-	7	
6. Inflow to the Tuyamunyun hydrosystem	26.9	37.86	10.96
7. Runoff control in the Tuyamunyun hydrosystem reservoirs: runoff recharging (+) or runoff withdrawal (-)	-4.26	-2.51	1.75
8. Water losses in the Tuyamunyun hydrosystem reservoirs (-), lateral inflow (+)	-4.04	-1.4	2.64
<i>% of the inflow</i>	15	4	
9. Water withdrawal at the mid-stream, including water withdrawal from the Tuyamunyun hydrosystem (-)	-15.32	-14.17	1.15
10. Return collector & drainage flow at the downstream (+)	-	-	-
11. Sanitary and environmental releases to canals (-)	0	-1.57	-1.57
12. Flow losses (-) or unaccounted inflow to the channel (+)	-5.22	-5.02	0.2

Item of channel balance	Water volume, km <sup>3</sup>		Variance (actual-plan)
	Forecast/ planned	Actual	
<i>% of the flow at the Tuyamuyun gauging station</i>	30	16	
13. Water delivery to Priaralie and the Aral Sea (without collector & drainage flow)	2.1	14.59	12.49
<b>TOTAL losses:</b>	-9.76	-10.21	-0.45
<i>% of the river water content</i>	20	17	

Table 2.3

Water balance of the Amudarya river basin reservoirs for the vegetation period of 2010

Item of water balance	Water volume, km <sup>3</sup>		Variance (actual-plan)
	Forecast/ planned	Actual	
<b>1. Nurek reservoir</b>			
1.1 Water inflow to the reservoir	16.77	20.84	4.07
1.2 Water volume in the reservoir:			
- by the beginning of the season (April 1, 2010)	6.10	6.10	0
- by the end of the season (October 1, 2010)	10.50	10.51	0.01
1.3 Release from the reservoir	12.37	17.0	4.63
1.4 Lateral inflow (+) or water losses (-)	0	0.57	0.57
<i>% of the inflow to the reservoir</i>	0	3	
1.5 Runoff control: runoff recharge (+) or runoff withdrawal (-)	-4.40	-3.84	0.56
<b>2. Tuyamunyun hydrosystem reservoirs</b>			
2.1 Water inflow to the hydrosystem	26.9	37.86	10.96
2.2 Water volume in the reservoirs:			
- by the beginning of the season (April 1, 2010)	4.52	4.52	0
- by the end of the season (October 1, 2010)	4.74	5.63	0.89
2.3 Release from the hydrosystem reservoirs	22.64	35.35	12.71
Including:			
- discharge to the river	17.08	30.70	13.62
- water withdrawal	5.56	4.65	0.91
2.4 Lateral inflow (+) or water losses (-)	-4.04	-1.4	2.64
<i>% of the inflow to the reservoir</i>	15	4	
2.5 Runoff control: runoff recharging (+) or runoff withdrawal (-)	-4.26	-2.51	1.75
<b>TOTAL</b> runoff control by the reservoirs: runoff recharging (+) or runoff withdrawal (-)	-8.66	-6.35	2.31
<b>TOTAL</b> losses (-), unaccounted inflow (+)	-4.04	-0.83	3.21

## **Analysis of the water management situation in the Syrdarya and Amudarya river basins during the non-vegetation period of 2009/2010**

### **1 Syrdarya river basin**

The actual inflow to the upstream reservoirs of the Syrdarya River Basin (Toktogul, Andijan and Charvak) for the nonvegetation period was 6.82 km<sup>3</sup> or 122% predicted inflow. To this water volume additional releases from the upstream reservoirs accumulated during vegetation period were 3.72 km<sup>3</sup> that is 0.94 km<sup>3</sup> less the predicted one. So despite of increased inflow to the upstream reservoirs the actual release from them for the nonvegetation period was 10.54 km<sup>3</sup> that is 3% less the predicted one.

The total channel inflow to Naryn, Karadarya and Chirchik rivers (including the Ugam River) was 11.64 km<sup>3</sup> or 111% of predicted one; this allowed to increase the available regulated water resource of the basin up to 22.18 km<sup>3</sup>.

At the end of vegetation period 11.58 km<sup>3</sup> of water was accumulated in the upstream reservoirs including 9.62 km<sup>3</sup> or 116% of the predicted one - in the Toktogul reservoir. For comparison: at the end of nonvegetation period 2008-2009 there was only 6.42 km<sup>3</sup> in the Toktogul reservoir that is 3.2 km<sup>3</sup> less than at the beginning of vegetation period 2010.

At the 54th ICWC's meeting (14-15 January 2010, Shymkent) the proposals on the withdrawal limits and operational schedule for the Naryn-Syrdarya reservoirs cascade were accepted. Under these proposals the operation of reservoirs during three months (October- December) was being adopted de facto.

According to the proposed limits the water withdrawal from the Syrdarya River was 3.12 km<sup>3</sup> including: 0.04 km<sup>3</sup> - for the Kyrgyz Republic, 0.18 km<sup>3</sup> - for Tajikistan, 2.5 km<sup>3</sup> -for the Republic of Uzbekistan, 0.4 km<sup>3</sup> - for the Republic of Kazakhstan (through the Dustlik canal). Moreover the proposed water releases to Arnasay were 1.0 km<sup>3</sup> and water delivery to the Aral Sea and Priaralie was 2.2 km<sup>3</sup>.

Practically the water withdrawals from the river channel were being implemented according to the water users demand on the basis of actual water availability. For this reason the calculated water availability for some ten-days periods is less than its average for the season (Table 1.1). The planned water withdrawal from the Syrdarya River according to requirements (under the schedule) was 3.11 km<sup>3</sup> that is practically the same as the proposed water withdrawal limits (3.12 km<sup>3</sup>); de facto the water withdrawal was greater - 3.69 km<sup>3</sup> or 112% of the scheduled water amount.



However water supply was unequal for the states, river sites and was unsteady during the times (see Table 2.1, and also data on the website: [www.cawater-info.net/analysis/water/](http://www.cawater-info.net/analysis/water/)).

The obligations on water delivery to the Shardarinsky reservoir was implemented on 99%; the actual water inflow to the reservoir for the nonvegetation period 2009-2010 was 12.47 km<sup>3</sup> with the scheduled water inflow (planned) 12.55 km<sup>3</sup>.

Under the sufficient water inflow to the Shardarinsky reservoir the water release to the Arnasay was limited to 0.71 km<sup>3</sup> (60% of scheduled one), and the plan on the water delivery to the Aral Sea and Piaralie was implemented on 103%.

Actual channel losses at the Toktogul-Shardara section calculated by the balance method, amounted 2.3 km<sup>3</sup>, or 12% of the regulated flow of the Syr Darya River (Table 1.2). Analysis of channel balances for previous nonvegetation periods indicates that the channel losses in this section do not exceed 10%. Possible cause of significant residual (losses) in the nonvegetation period of 2009-2010 is overestimation of lateral flow (on 10-15%).

Analysis of reservoirs' water balances in the Syrdarya basin (Table 1.3) has revealed the nonregistered inflow to the Toktogul, Kairakkum and Shardara within the total volume of 1.8 km<sup>3</sup>, while the expected losses was 0.36 km<sup>3</sup> according to the schedule (plan). In the Andijan and Charvak reservoirs the total water losses were 0.28 km<sup>3</sup>.

Attention is needed to the fact that over the past 5 years (2004-2005 ... 2008-2009) the average annual inflow to the Toktogul reservoir was 12.56 km<sup>3</sup>, including 12.3 km<sup>3</sup> for the nonvegetation period. The water inflow for nonvegetation period of 2009-2010 amounted to 3.9 km<sup>3</sup> that exceeds the average inflow over the past 5 years by 0.78 km<sup>3</sup>.

Over the past 5 years the average volume of releases from the Toktogul reservoir for the nonvegetation period is estimated at 8.66 km<sup>3</sup>. During the nonvegetation period of 2009-2010 there was 6.97 km<sup>3</sup> of released water, which is less than the average volume of releases over the past 5 years by 1.69 km<sup>3</sup> (see Table 1.4). Compared with the period 2006-2008, the nonvegetation releases for 2009-2010 have decreased by 2.5 ... 2.8 km<sup>3</sup>.

According to our estimates, the releases from the Toktogul reservoir for the nonvegetation period 2009-2010 are totally in line with own energy needs of Kyrgyzstan and should allow (owing to saving certain volume of water in the reservoir to the beginning of vegetation period) to implement the releases during the vegetation period about 5 km<sup>3</sup> of water.

Table 1.1

Indicators of water supply in the Syrdarya river basin countries  
for the non-vegetation period of 2009-2010.

Water user	Water volume, km <sup>3</sup>		Level of water supply, %		Deficit (-), surplus (+), km <sup>3</sup>	
	Limit/schedule	Actual	Season	Min for ten-day period*)	Season	Total for ten-day period**)
1. Total water withdrawal	3.101	3.688	119	48	0	0.804
2. By countries:						
Kyrgyz Republic	0.037	0.032	86	37	0.005	0.014
Republic of Uzbekistan	2.484	3.263	131	38	0	0.418
Republic of Tajikistan	0.180	0.081	45	0	0.099	0.106
Republic of Kazakhstan	0.400	0.312	78	0	0.088	0.266
3. At sites						
Toktogul reservoir – Uchkurgan Hydraulic Site (HS)	1.329	1.497	113	50	0	0.203
<i>Including:</i>						
<i>Kyrgyz Republic</i>	0.030	0.030	100	37	0	0.009
<i>Republic of Tajikistan</i>	0.047	0.031	66	0	0.016	0.023
<i>Republic of Uzbekistan</i>	1.252	1.436	115	52	0	0.171
Uchkurgan HS – Kayrakum HS	0.222	0.224	101	37	0	0.085
<i>Including:</i>						
<i>Kyrgyz Republic</i>	0.007	0.002	29	0	0.005	0.005
<i>Republic of Tajikistan</i>	0.044	0.016	36	0	0.028	0.028
<i>Republic of Uzbekistan</i>	0.171	0.206	120	37	0	0.052
Kayrakum HS – Shardara reservoir	1.550	1.967	127	43	0	0.516
<i>Including:</i>						
<i>Republic of Kazakhstan</i>	0.400	0.312	78	27	0.088	0.266
<i>Republic of Tajikistan</i>	0.089	0.034	38	0	0.055	0.055
<i>Republic of Uzbekistan</i>	1061	1.621	153	4	0	0.195
4. In addition:						
Inflow to the Shardara reservoir	12.554	12.465	99	68	0.089	0.469
Discharge to Arnasay	1.182	0.711	60	0	0.471	0.777
Delivery to the Aral Sea and Priaralie	2.351	2.430	103	-	-	-

\*) Minimum water supply level registered in December.

\*\*\*) Total of the registered water deficit for ten-day periods; it is partly or fully covered by water surplus within a season up the value “season deficit”.

Table 1.2

Syrdarya river channel balance for the non-vegetation period of 2009-2010

Item of channel balance	Water volume, km <sup>3</sup>		Variance (actual-plan)
	forecast/pl an	actual	
1. Inflow to the Toktogul reservoir	3.308	3.898	0.59
2. Lateral inflow at the Toktogul reservoir – Shardara reservoir site (+)	10.21	12.303	2.093
<i>Including:</i>			
<i>Discharge to the Karadarya river</i>	<i>1.439</i>	<i>1.923</i>	<i>0.484</i>
<i>Discharge to the Chirchik river</i>	<i>1.472</i>	<i>2.382</i>	<i>0.91</i>
<i>Lateral inflow through collector &amp; drainage networks and small rivers</i>	<i>7.299</i>	<i>7.998</i>	<i>0.699</i>
3. Control of the reservoir runoff: recharge (+) or withdrawal (-)	2.394	2.259	- 0.135
<i>Including:</i>			
<i>Toktogul reservoir</i>	<i>4.358</i>	<i>3.067</i>	<i>- 1.291</i>
<i>Kayrakum reservoir</i>	<i>- 1.964</i>	<i>- 0.808</i>	<i>1.156</i>
4. Regulated runoff (1+2+3)	15.912	18.460	2.548
5. Water withdrawal at the Toktogul-Shardara site (-)	- 3.101	- 3.688	0.587
6. Runoff losses (-) or unaccounted inflow to the channel (+) at the Toktogul-Shardara site	- 0.257	- 2.307	- 2.05
<i>Including % of regulated runoff</i>	<i>- 1.6%</i>	<i>- 12%</i>	
7. Inflow to the Shardara reservoir	12.554	12.465	- 0.089
8. Control of the Shardara reservoir runoff: recharge (+) or withdrawal (-)	- 4.399	- 3.986	0.413
9. Release from the Shardara reservoir	8.155	8.479	0.324
10. Discharge to Arnasay (-)	- 1.182	- 0.711	0.471
11. Flow consumption at the lower reaches: algebraic sum of water withdrawal (-), lateral inflow (+), and losses (-)	- 4.622	- 5.338	- 0.716
12. Delivery to the Aral Sea and Priaralie	2.351	2.430	0.079

Table 1.3

 Water balance of the Syrdarya river basin reservoirs  
for the non-vegetation period of 2009-2010

Item of water balance	Water volume, km <sup>3</sup>		Variance (actual-plan)
	forecast/plan	actual	
<b>1. Toktogul reservoir</b>			
Water inflow to the reservoir	3.308	3.898	0.59
Water volume in the reservoir:			
- by the beginning of the season (October 1, 2009)	12.674	12.674	0
- by the end of the season (March 31, 2010)	8.303	9.617	1.314
Release from the reservoir	7.666	6.965	- 0.701
Unaccounted inflow (+) or water losses (-)	- 0.013	0.010	0.023
<i>Including % of the inflow to the reservoir</i>	<i>- 0.4%</i>	<i>0.3%</i>	
Runoff control: runoff recharge (+) or runoff withdrawal (-)	4.358	3.067	- 1.291
<b>2. Andijan reservoir</b>			
Water inflow to the reservoir	0.869	1.087	0.218
Water volume in the reservoir:			
- by the beginning of the season (October 1, 2009)	0.905	0.905	0
- by the end of the season (March 31, 2010)	1.263	1.147	- 0.116
Release from the reservoir	0.510	0.816	0.306
Unaccounted inflow (+) or water losses (-)	- 0.001	- 0.029	- 0.028
<i>Including % of the inflow to the reservoir</i>	<i>- 0.1%</i>	<i>- 3%</i>	
Runoff control: runoff recharge (+) or runoff withdrawal (-)	- 0.359	- 0.271	0.088
<b>3. Charvak reservoir</b>			
Water inflow to the reservoir	1.423	1.831	0.408
Water volume in the reservoir:			
- by the beginning of the season (October 1, 2009)	1.992	1.992	0
- by the end of the season (March 31, 2010)	1.332	0.820	- 0.512
Release from the reservoir	2.080	2.755	0.675
Unaccounted inflow (+) or water losses (-)	- 0.003	- 0.248	- 0.245
<i>Including % of the inflow to the reservoir</i>	<i>- 0.2%</i>	<i>- 13%</i>	
Runoff control: runoff recharge (+) or runoff withdrawal (-)	0.567	0.924	0.357
<b>4. Kayrakum reservoir</b>			
Water inflow to the reservoir	11.219	11.001	- 0.209
Lateral inflow	0.400	0.424	0.024
Water volume in the reservoir:			
- by the beginning of the season (October 1, 2009)	1.315	1.315	0
- by the end of the season (March 31, 2010)	3.418	3.418	0
Release from the reservoir	9.255	10.193	0.938
<i>Including:</i>			
- discharge to the river	9.225	10.163	0.938
- water withdrawal from the reservoir	0.030	0.030	0
Unaccounted inflow (+) or water losses (-)	- 0.261	0.871	1.131
<i>Including % of the inflow to the reservoir</i>	<i>- 2%</i>	<i>8%</i>	
Runoff control: runoff recharge (+) or runoff withdrawal (-)	- 1.964	- 0.808	1.156
<b>5. Shardara reservoir</b>			

Item of water balance	Water volume, km <sup>3</sup>		Variance (actual-plan)
	forecast/plan	actual	
Water inflow to the reservoir	12.554	12.465	- 0.089
Lateral inflow	-	-	-
Water volume in the reservoir:			
- by the beginning of the season (October 1, 2009)	1.091	1.091	0
- by the end of the season (March 31, 2010)	5.400	5.277	- 0.123
Release from the reservoir	8.155	8.479	0.324
<i>Including:</i>			
- discharge to Arnasay	1.182	0.711	- 0.471
- discharge to the river	6.890	7.416	0.526
- water withdrawal from the reservoir	0.083	0.352	0.269
Unaccounted inflow (+) or water losses (-)	- 0.09	0.200	0.290
% of the inflow to the reservoir	- 0.7%	1.6%	
Runoff control: runoff recharge (+) or runoff withdrawal (-)	- 4.399	- 3.986	0.413
TOTAL runoff control by the reservoirs: runoff recharge (+) or runoff withdrawal (-)	- 1.797	- 1.074	0.723

Table 1.4

#### Inflow and discharge from the Toktogul reservoir for 2004-2009

Hydrologic year	Inflow, mln. m <sup>3</sup>			Discharge, mln. m <sup>3</sup>		
	Non-vegetation period	Vegetation period		Non-vegetation period	Vegetation period	
2004-2005	3767	10692	14459	9045	6829	15874
2005-2006	3496	10362	13858	9082	5418	14500
2006-2007	3157	8911	12068	9538	5857	15395
2007-2008	2505	7371	9876	9726	4408	14134
2008-2009	2672	9876	12548	5884	5748	11632
Average of 5 years	3119	9442	12561	8655	5652	14307

## 2 Amudarya river basin

The actual water content of the Amudarya river at the Atamyrat gauging station (GS) conditional (upstream to the water intake into Garagumdarya), which was calculated on the basis of natural discharges of the Vaksh river (without runoff regulation by the Nurek reservoir), given with water withdrawal to the Republic of Tajikistan and Surkhandarya region was 11.93 km<sup>3</sup> or 84% of the rate.

Additionally 4.85 km<sup>3</sup> of water was released from the Nurek reservoir and the actual flow at the Atamyrat GS (upstream to the water intake into Garagumdarya) amounted 16.78 km<sup>3</sup> that exceeds the expected one (planned) by 13%.

In the existing water management situation the defined water withdrawal limit in the Amu Darya River Basin was used by 98%, and total water withdrawal amounted

to 15.4 km<sup>3</sup>, including 12.75 km<sup>3</sup> down the Atamyrat GS (starting from the water intake into Garagumdarya ).

However water supplying was unequal for the states, river sites and was unsteady during the time (see Table 2.1, and also data on the website: [www.cawater-info.net/analysis/water/](http://www.cawater-info.net/analysis/water/)).

The defined limit of sanitary-environmental water releases into the Amudarya downstream canals was used by 95%; water delivery amounted 0.76 km<sup>3</sup>. Water delivery to the Aral Sea and Priaralie amounted 1.92 km<sup>3</sup> or 91% of planned flow (see Table 2.2).

At the end of season only 6.17 km<sup>3</sup> of water was stored in the Nurek reservoir or less the planned volume by 0.23 km<sup>3</sup>, and in the TMHS reservoirs - 4.56 km<sup>3</sup> or more than the planned one by 0.92 km<sup>3</sup> (see Table 2.3). The total additional water volume to the river flow due to Nurek and Tuyamuyun reservoirs drawdown amounted 5.64 km<sup>3</sup>.

The water losses of the Amudarya river at the Atamyrat-Darganata section, which were calculated by the balance method (as the water balance residual) amounted 1.35 km<sup>3</sup> or 8% of water flow at the Atamyrat GS. The water losses in the TMHS reservoirs amounted 0.42 km<sup>3</sup> (5% of water inflow) and in the Tuyamuyun-Samanbay section - 1.52 km<sup>3</sup> or 23% of water flow at the Tuyamuyun hydropost. For comparison: the recommended calculated limits of Amudarya river channel losses at the Atamyrat-Darganata section (according to the ADB RETA 6163 project) amounted 5, and at the Tuyamuyun-Samanbay- section - 21%. Thereby the actual losses exceeded the recommended (calculated) ones for the middle Amudarya by 3%, and for lower Amudarya - 2%.

There are no losses in the Nurek reservoir, the nonregistered inflow of 0.49 km<sup>3</sup> is discovered by means of the balance method (13% of the inflow to the reservoir through the Vaksh river).

In spite of relatively low water content of the river, which was calculated in % as the ratio of actual water content to the average long-term flow (84% of the average long-term flow), the probability of water withdrawal (98%) and probability of water delivery to the Aral Sea and Priaralie (91%) were higher than relative water content of the river owing to reservoirs' drawdown.

The total water deficit amounted 2% only, including within the Republic of Tajikistan - 8%, the Republic of Uzbekistan - 2%. Turkmenistan exceeded water limit by 5%.

The total actual water losses from the river channels and reservoirs amounted 2.29 km<sup>3</sup> or about 14% of river flow at the Atamyrat GS what is near the recommended ones.

At the same time the usable storage of the Nurek reservoir at the beginning of vegetation period was extremely low (approximately 0.2 km<sup>3</sup>).

Table 2.1

Indicators of water supply in the Amudarya river basin countries  
for the non-vegetation period of 2009-2010

Water user	Water volume, km <sup>3</sup>		Level of water supply, %		Deficit, km <sup>3</sup>	
	Limit/schedule	Actual	Season	Min for ten-day period*)	Season	Total for ten-day period**)
1. Total water withdrawal	15.70	15.40	98	66	0.30	2.52
2. By countries:						
Kyrgyz Republic	-	-	-	-	-	-
Republic of Tajikistan	2.85	2.35	82	52	0.50	0.58
Turkmenistan	6.50	6.80	105	76	0	0.48
Republic of Uzbekistan	6.35	6.25	98	53	0.10	1.46
3. Atamyrat GS downstream ***)	12.48	12.75	102	69	0	1.8
<i>Including:</i>						
<i>Turkmenistan</i>	6.50	6.80	105	76	0	0.48
<i>Republic of Uzbekistan</i>	5.98	5.95	99	51	0.03	1.32
4. At sites:						
Upstream	3.22	2.65	82	48	0.57	0.72
<i>Including:</i>						
<i>Kyrgyz Republic</i>	-	-	-	-	-	-
<i>Republic of Tajikistan</i>	2.85	2.35	82	52	0.50	0.58
<i>Surkhandarya province, Uzbekistan</i>	0.37	0.30	81	0	0.07	0.14
Mid-stream	8.35	8.23	99	74	0.12	0.64
<i>Including:</i>						
<i>Turkmenistan</i>	5.10	5.05	100	76	0.05	0.36
<i>Republic of Uzbekistan</i>	3.25	3.15	97	71	0.10	0.28
Downstream	4.13	4.52	109	7	0	1.16
<i>Including:</i>						
<i>Turkmenistan</i>	1.40	1.72	123	65	0	0.12
<i>Republic of Uzbekistan</i>	2.73	2.80	103	7	0	1.04
5. In addition:						
Sanitary and ecological releases to the downstream canals	0.80	0.76	95	0	0.04	0.24
<i>Including:</i>						
<i>Turkmenistan</i>	0.15	0.15	100	0	0	0.09
<i>Republic of Uzbekistan</i>	0.65	0.61	94	0	0.04	0.15
Water delivery to the Aral Sea and Priaralie	2.10	1.92	91	62	0.18	0.18

\*) Minimum water supply level registered for ten-day periods.

\*\*\*) Total registered water deficit for ten-day periods; it is partly or fully covered by water surplus within a season up to the value "season deficit".

\*\*\*\*) Atamyrat gauging station taken conventionally: it is Amudarya river station upstream of the water withdrawal to the Garagumdarya river.

Table 2.2

## Syrdarya river channel balance for the non-vegetation period of 2009-2010

Item of channel balance	Water volume, km <sup>3</sup>		Variance (actual-plan)
	forecast/plan	actual	
1. Amudarya river water content: unregulated flow at the conventional Atamyrat GS	10.59	11.93	1.34
2. Runoff control in the Nurek reservoir: runoff recharge (+) or runoff withdrawal (-)	4.13	4.85	0.72
3. Midstream water withdrawal (-)	- 8.35	- 8.23	0.12
4. Midstream return collector & drainage flow (+)	0.93	0.70	- 0.23
5. Runoff losses (-) or unaccounted inflow to the channel (+)	0	- 1.35	- 1.35
<i>Including % of the flow at the conventional Atamyrat GS</i>	<i>0</i>	<i>- 8 %</i>	<i>- 8 %</i>
6. Inflow to the Tuyamuyun hydrosystem	7.30	7.90	0.6
7. Runoff control in the Tuyamuyun hydrosystem reservoirs: runoff recharge (+) or runoff withdrawal (-)	0.70	0.79	0.09
8. Downstream water withdrawa, including water withdrawal from the Tuyamuyun hydrosystem (-)	- 4.13	- 4.52	- 0.39
9. Upstream return collector & drainage flow (+)	0.02	0.03	0.01
10. Sanitary and ecological releases to the canals (-)	- 0.80	- 0.76	0.04
11. Runoff losses (-) or unaccounted inflow to the channel (+)	- 0.99	- 1.52	- 0.53
<i>Including % of the flow at the Tuyamuyun GS</i>	<i>- 17%</i>	<i>- 23%</i>	<i>- 6%</i>
12. Delivery to the Aral Sea and Priaralie	2.10	1.92	- 0.18

Table 2.3

## Water balance of the Amudarya river basin reservoirs for the non-vegetation period of 2009-2010

Item of water balance	Water volume, km <sup>3</sup>		Variance (actual-plan)
	forecast/plan	actual	
<b>1. Nurek reservoir</b>			
Water inflow to the reservoir	3.52	3.68	0.16
Water volume in the reservoir:			
- by the beginning of the season (October 1, 2009)	10.53	10.53	0
- by the end of the season (March 31, 2010)	6.40	6.17	- 0.23
Release from the reservoir	7.65	8.53	0.88
Unaccounted inflow (+) or water losses (-)	0	0.49	0.49
<i>Including % of the inflow to the reservoir</i>	<i>0%</i>	<i>13%</i>	<i>13%</i>
Runoff control: runoff recharge (+) or runoff withdrawal (-)	4.13	4.85	0.72
<b>2. Tuyamuyun hydrosystem reservoirs</b>			
Water inflow to the hydrosystem	7.30	7.90	0.60
Water volume in the reservoirs:			
- by the beginning of the season (October 1, 2009)	5.77	5.77	0
- by the end of the season (March 31, 2010)	3.64	4.56	0.92
Release from the hydrosystem	8.00	8.69	0.69
Including:			



Item of water balance	Water volume, km <sup>3</sup>		Variance (actual-plan)
	forecast/plan	actual	
- water release to the river	5.90	6.60	0.7
- water withdrawal	2.10	2.09	- 0.01
Unaccounted inflow (+) or water losses (-)	- 1.43	- 0.42	1.01
<i>Including % of the inflow to the reservoir</i>	<i>19%</i>	<i>5%</i>	<i>-14%</i>
Runoff control: runoff recharge (+) or runoff withdrawal (-)	0.70	0.79	0.09
TOTAL runoff control by the reservoirs: runoff recharge (+) or runoff withdrawal (-)	4.83	5.64	0.81

## Learning Week of Water Resources Knowledge Hubs

On April 19-23, 2010, a seminar was held in Manila (the Philippines), in which representatives of fourteen Knowledge Hubs (the representatives of other three Hubs could not come for various reasons) as well as representatives of the seminar organizers (ADB, UNESCO-IHE) took part.

The meeting was opened by Mr. Wouter Arriens, lead water resources specialist, Regional and Sustainable Development Department of the Asian Development Bank. He introduced the participants to the strategic plans of ADB up to year 2020, particularly, related to the activity focused on knowledge dissemination and capacity building in the water sector as well as in other areas associated with it (environment, energy, etc.) by means of the Knowledge Hubs (Hubs), the establishment of which was initiated was ADB and UNESCO-IHE.

Also, the Seminar Coordinator, APWF KnowledgeHubs Secretariat Manager Mr. Ramon Alikpala and a specialist from the UNESCO-IHE Institute for Water Education, Knowledge Management Consultant Mr. Carel Keuls delivered speeches.

Then, a discussion on the factors influencing the Hub operation was conducted by Mr. Carel Keuls. The majority of the seminar participants concurred in that the main factor is availability of human resources and sufficient (target) financing, at that, the former problem is often connected to the latter one.

In the second half of the first seminar day, a few presentations were delivered by the Chief Specialist of the Knowledge Management Center of the ADB Regional and Sustainable Development Department Mr. Olivier Serrat. The first presentation was about the principles of partnership with the purpose to disseminate knowledge, about the participants and forms of partnership, knowledge management, etc. His next report was about the connection between research and practice, i.e. significance of the research results (experience gained and knowledge acquired) dissemination to the potential user, as well as about the compliance of the research goals with the user's goals. Despite the interesting contents of the material presented, the presentation itself was somewhat boring, which was marked by many listeners.

The first day ended with a sort of exhibition of the Hubs' products and services. The effectiveness of that action was not high enough because the Hubs representatives had to choose: either to stay at the table assigned to every Hub and present its products or walk around the room and get familiar with the products of other Hubs.

That day, the seminar participants were divided into four groups. Each of them, beginning from the second day of the seminar, should make an assessment of the past day results (effectiveness) and share it the following morning.

The next day started from the assessment report of Group 1 concerning the last seminar day results; the Group gave its comments/notes as well as proposals on tighter and effective cooperation among the Hubs. In particular, the Group called all Hubs and the Hubs Network establishment initiators for more active exchanging of relevant knowledge and experience among the network members. To that end, it was proposed to create an additional webpage or section on the basis of the existing website, where all Hubs would put the information related to their relevant works, problems faced during the works, ways and approaches to solve those, and share the experience and successful case studies of solving relevant problems, etc. However, because of lack of funding such activity can be undertaken on a voluntary basis for some time, but with the lapse of time it can fade out without appropriate financing.

Then Carel Keuls delivered an interesting presentation about the knowledge exchange/dissemination network management, basic elements of network development, as well as the role of Hub in this process.

Then, Internet communication with another UNESCO-IHE expert was arranged. It was Head of Hydroinformation Technology and Knowledge Management Department Mr. Jan Luijendijk, who at the time managed a project of capacity building for efficient streams regulation in the basin of the transboundary Nile River running through the territories of nine African countries and, thus, causing problems common for a majority of transboundary rivers (including those in Central Asia). Particularly, when he was asked about the information exchange on river water resources use among the upstream and midstream/downstream countries, he answered that it had been really a challenge because not all parties willingly provided such information, or they presented corrupted data, therefore often they had to obtain information by quiet behind-the-scenes work. In addition, he shared his experience in the development of knowledge dissemination network, and its further improvement.

The working day ended with analyses of case studies associated with water resources by way of examples of several participant-countries selected. One of the groups, where the SIC ICWC Hub representative was also included, analyzed the problem presented by the Indian Institute TERI by the case study of shared management of the transboundary river Ganges (in that case, among the riparian states of the country). The groups were supposed to decide the main problems needed to be settled and identify the ways to do that, i.e. decide the first three steps to be undertaken in order to resolve that problem. The Group 1 came to the following decision:

1. Identify the whole range of problems and concerns of every riparian party;

2. Organize meetings/discussions of all riparian parties, where they could arrive at a coordinated mutually advantageous decision and make a concrete agreement on the river basin water resources allocation, future information exchange, etc.
3. Monitor the execution of the commitments taken by every party.

At the beginning of the third day, Group 2 delivered its report reflecting the results of the previous day.

Later on, Mr. Wouter Arriens gave a presentation on the mobilization of (financial) means for the organization of successful knowledge center work and possible participation of ADB. The information concerning the possibility to get 50 thousand US dollar grants for small-scale projects, including development of a knowledge center. More detailed information is available at the ADB website [www.adb.org](http://www.adb.org).

Website creation related presentation (viz. what mistakes should be avoided, what rules should be adhered to make an effective website, and so forth) as well as the following report on knowledge and information dissemination methods (through the Internet, mass media, mobile communication, etc.) were also rather interesting.

The visit to the Laguna Lake Development Authority office gave the seminar participants an opportunity to see the consequences of flooding in the lake basin area, get familiar with the ways of settlement of such a problem, attraction of the public and government attention to that problem, etc.

In the morning of the fourth seminar day, they arranged meetings with ADB specialists who were in charge of the regions or fields (issues) that interested each Hub.

In the afternoon, the four groups of participants, formed on the first day, worked on so-called SWOT analysis for a knowledge centers network, i.e. identify its advantages, disadvantages, opportunities, and possible threats to its operation. Every group was supposed to compare its results with those of the other groups, explain and justify those, and listen to the comments/notes from other groups. During that practical part of the seminar, it was interesting to know the views of representatives from different countries concerning the weaknesses and strengths of a Hubs network.

The last day was mostly devoted to the presentations by the Knowledge Hubs representatives reflecting the clients and markets of their Hubs, ways to improve the Hubs efficiency, relevant problems, and reporting of the plans for 2010. At the presentation of the Knowledge Hub under SIC ICWC, SIC ICWC proposals regarding the enhancement of the efficiency of the cooperation among the Aral Sea basin countries and their relevant organizations were presented. In addition to the demonstration of the SIC ICWC Hub products and services, clients, plans, etc., the issues of “weak communication” and lack of collaboration among the Hubs Network members were mentioned once again; in that context, on behalf of the SIC ICWC management, the seminar participants and organizers were thereupon invited to visit SIC ICWC with the purpose of visual and better acquaintance with its activities, resources (both technical and human).

At the end of the seminar, Mr. C. Keuls presented the BSCW Collaborative Platform developed by UNESCO-IHE, on the basis of which all Hubs would be able to communicate, exchange information and data, and so on. All the seminar participants were given the links to be registered on the platform.

Furthermore, during a separate talk, Mr. Keuls informed the SIC ICWC Hub representative that because of a great number of the Hubs a few ones would be chosen out with which UNESCO-IHE decided to collaborate more closely in the Hub development area, and SIC ICWC was among the chosen those. Mr. Keuls' offer consisted of two options as follows:

1. The UNESCO-IHE Institute offers its assistance in the development of a knowledge dissemination network in association with other partners and clients in the region. For example, establishment of another knowledge hub, organization of relevant workshops, etc., as well as identification of the requirements for successful development of the Hub.
2. Cooperation in the water sector. In particular, participation of SIC ICWC Hub specialist(s) together with UNESCO-IHE specialist(s) in the development of a relevant research project, establishment of an online training course allowing direct communication between the trainees and trainer, etc.

In view of the agreement between both institutions (SIC ICWC and UNESCO-IHE) on cooperation in capacity building (within the training center activity), the second option seems more suitable for cooperative association.

In addition, SIC ICWC was offered to join the Network of Asian River Basin Organizations (NARBO); also before such an offer was made to SIC ICWC.

In whole, it may be said that the Hubs learning week was successful in the sense that the Hubs agreed to more actively communicate with each other, most probably, through the BSCW platform proposed, and they called the APWF KnowledgeHubs Network Secretariat for more intensive fulfillment of its role as the Hubs communication process coordinator. Yet, there is a probability that with lack of targeted financing, such enthusiasm of the Hubs will weaken in time again. Besides, some Hubs have no clear idea of what form and what kind of collaboration can be established among Hubs apart from mere communication by means of the BSCW platform.

Moreover, a few open problems have remained as follows:

1. There is no a clear and unambiguous answer to the question concerning financing of the Hubs activities (at least, by selecting a few Hubs through competitive bidding; review of business plans; etc.).
2. Despite that according to the seminar plan a strategic Hubs Network program was supposed to be developed, that problem has not been solved.

It is interesting that some seminar participants had not heard before about Uzbekistan, Kazakhstan, and other Central Asian countries, and even had hardly known about the

Central Asian region; and after the seminar, representatives of some Hubs showed interest in visiting SIC ICWC and in possible cooperation with it.

## **Constitutive convention and review workshop of the regional network of water organizations from Eastern Europe, Caucasus and Central Asia**

The review workshop of the Network of Water Organizations from Eastern Europe, Caucasus and Central Asia (NWO EECCA) was held in Moscow on the 31st of May, 2010 under support of the Moscow State University of Environmental Engineering.

50 representatives of research, design, manufacturing and information institutions from Russia, Ukraine, Byelorussia, Moldova, Uzbekistan, Kazakhstan, Kyrgyzstan, Tajikistan, and Azerbaijan took part in the workshop

The participants were welcomed by:

- Deputy Director of the Federal Water Resources Agency (Russian Federation) Sergey Natal'tchuk
- Rector of the Moscow State University of Environmental Engineering Prof. Dmitry Kozlov
- President of JSC "Vodstroy" Polad Polad-zadeh
- Head of Land Reclamation Department at the Ministry of Agriculture of the Russian Federation A.Petrov

Presentations were made by:

- Prof. V.Dykhovny (SIC ICWC, Uzbekistan) – Current water sector trends in EECCA countries
- Prof. P.Kovalenko (UkrNIIGiM, Ukraine) – Sustainable operation of irrigation and drainage systems under socio-economic transformation in East Europe countries
- V.Sokolov (GWP CACENA, Uzbekistan) – International Network of Basin Organizations and our participation in this Network
- I.Beglov (SIC ICWC, Uzbekistan) – Status of information exchange and the development of NWO EECCA

- Prof. M.Kalinin (International State Ecological University, Byelorussia) – The Byelorussian contribution to international cooperation on water resources improvement
- S.Trophantchuk (Seversk-Donets Basin Department, Ukraine) – Experience of integrated water resources management and development of water network and data exchange on water resources in the Seversk Donets river basin
- S.Tanatbayeva (Water Resources Committee, Kazakhstan) – Development of water sector in the Republic of Kazakhstan
- N.Mamataliev (Kyrgyz branch of SIC ICWC, Kyrgyzstan) - Development of water sector in the Kyrgyz Republic
- Prof. T.Karlykhanov (Executive Committee of IFAS, Kazakhstan) – Review of a network of water organizations in Central Asia
- G.Stulina (SIC ICWC, Uzbekistan) – Gender and water
- Kh.Mukhitdinov (ICWC Secretariat, Tajikistan) – Institutional development for the integrated water resources management in Tajikistan
- A.Mamedov (Institute “Sukanal”, Azerbaijan) – Challenges and prospects of water management in Azerbaijan
- Prof. M.Korobochkin (State University of Land Management, Russia) – Automated system for optimal design of vertical leveling
- I.Trombitskiy (Eco-Tiras, Moldova)
- N.Prokhorova (RosNIIVH, Russia)
- Ye.Finoshina (Meliovodinform, Russia)

Water sector and land reclamation in EECCA region go through a period of unstable development causing various difficulties and sometimes unexpected unfortunate results. This is typical for both the countries of the former Soviet Union and the East Europe countries that previously have been considered as a bastion of market economy development (Poland, Hungary, Romania), with enough high economic potential and per capita national income. These countries turned out to be unprepared to the current period like all the NIS countries, including such former leaders as Russian, Ukraine and others.

The following common tendencies are notable:

- More than twofold drop of unit GNP – from 3088 \$/capita in 1985 down to 1086 \$/capita in 2008 (World Bank’s data);
- Dramatic reduction of state subsidies for water sector and land reclamation;
- Loss of integrity by water sector as an independent economic sector (excluding some countries) and continuing changes: water sector incorporated into agriculture or environmental management;

- Transfer of water management at lower water-use levels to water users themselves;
- Growth of water “localism”;
- Loss of general water productivity;
- Dramatic reduction of annual operational costs from 60 \$/ha (the 1990-es) to 8-10 \$/ha (present) in irrigated land;
- Abrupt decrease in irrigated areas;
- No accounting and reporting on water use.

What can we oppose against those tendencies?

- Demonstration of water professionalism and the sainthood of water, return to old traditions;
- Water and ethics;
- Water and education;
- Forecasts of the future and their interpretation;
- Propaganda of best practices;
- Exchange of information;
- All-round implementation of IWRM.

The development of NWO EECCA will be oriented exactly towards the above listed directions.

The participants, having discussed the reports and exchanged their opinions, have made the following decision:

- Recognize an importance of information-based and professional integration of water professionals, land reclamation experts, water users and other stakeholders in EECCA countries.
- Deem it expedient to support a proposal of the International Network of Basin Organizations regarding the establishment of a regional sub-network and establish NWO EECCA within this Network.
- Take the goals, objectives and methods of the International Network of Basin Organizations as a basis – i.e. promoting the adoption of the integrated water resources management at a river basin level as the main tool of sustainable development – and complement them by specific goals and objectives of NWO EECCA, such as creating conditions for comprehensive and environmentally friendly rational use of water and reclaimed land.
- Make special mention of SIC’s efforts in developing the Network of Water Organizations in EECCA countries (NWO EECCA).

- The participants appreciate support of the UN Economic Commission for Europe and the Government of the Russian Federation for this event and thank SIC ICWC and the Moscow State University of Environmental Engineering for organization of the event.

After the workshop, the Constitutive Convention of the Network of Water Organizations from Eastern Europe, Caucasus and Central Asia was gathered.

Participants of the Convention meeting considered the following agenda:

- Approval of the Charter of NWO EECCA
- Election of the Network's President
- Election of the Board of Directors
- Review and approval of the Statute of Secretariat – the Network's executive body
- Assigning of the Executive Secretary of the Network – the head of the Secretariat.

P.A.Polad-zadeh was elected unanimously the President of the Network, while Prof. V.A.Dukhovny – the Executive Secretary of the Network.

The following members were elected to the Network's Board of Directors:

- Prof. Dmitry Kozlov, Moscow State University of Environmental Engineering, Rector, Russian Federation
- Sergey Bednaruk, Center for Russian Waterworks Inventory and State Water Cadastre, Director, Russian Federation
- Sergey Natal'tchuk, Federal Water Resources Agency, Deputy Director, Russian Federation
- Prof. Petro Kovalenko, Institute of Hydraulic Engineering and Land Reclamation of Ukrainian Academy of agrarian sciences, Director, ICID Vice-President, Ukraine
- Sergey Trophanchuk, Seversk-Donets Basin Department, Chief Engineer, Ukraine
- Prof. Victor Dukhovny, SIC ICWC, Director, Governor of the World Water Council's Board of Governors, Uzbekistan – Executive Secretary, Director of the Network's Secretariat
- Makhmud Khamidov, Basin Water Organization "Syrdarya", Uzbekistan
- Prof. Mikhail Kalinin, International State University of Ecology named by A.D.Sakharov, Byelorussia
- Akhmed Mammadov, Research and Design Institute "Sukanal", Deputy Director, Azerbaijan



- Khairullo Mukhitdinov, ICWC Secretariat, Director, Tajikistan
- Nurgazy Mamataliev, IWRM-Fergana Regional Project, National Coordinator for Kyrgyzstan
- Ilya Trombitzkiy, International Environmental Association for Saving the Dniester River “ECO-TIRAS”, Executive Director, Moldova
- Prof. Torekhan Karlikhanov, Executive Committee of the International Fund for Saving the Aral Sea, Director of Information-Analytical Center, Kazakhstan
- Nadezhda Prokhorova, Russian Research Institute of Multipurpose Use and Protection of Water Resources, Director, Russian Federation
- Nikolay Tupikin, Scientific and Technological Information Center “Meliovodinform”, Director, Russian Federation

## **International Forum ECWATECH-2010: «Water: Ecology and Technology»**

The 9th international water forum ECWATECH-2010 was held in the International Exhibition Center "Crocus Expo" in June 1-4, 2010.

The Forum organizers were the Ministry of Natural Resources and Ecology of the Russian Federation, the Ministry of Regional Development of the Russian Federation, the National Union “Vodokanal”, the Russian Association for Water Supply and Sanitation, and SIBICO International LLC.

This Forum ECWATECH – the 9th in succession – was held successfully and can be ranked among the world well-known water exhibitions, such as Aquatech (the Netherlands), Wasser Berlin (Germany), and WEFTEC (USA). On an area of more than 14000 square meters, 742 companies from 28 countries presented their products and services. More than 13000 professionals visited the exhibition; moreover the percentage of visitors from abroad has increased twice as compared to previous years. This indicates to growing interest of the world water community to this biennial event in Moscow.

Among 25 events in the Forum’s agenda, especially notable there were the Conference of the Ministry of Natural Resources and Ecology “Water Resources as a Strategic Factor of Socio-Economic Development”, the workshop of the National Union “Vodokanal” on prospective development of water sector up to 2020, the Conference of the Russian Association for Water Supply and Sanitation “Role and Place of Centralized Water Supply and Sanitation in Provision of Population with Water”, and the Conference of the International Water Association “Water Production and Domestic Wastewater Treatment in XXIst Century: Technologies,

Design Choices, Operation”. More than 1000 professionals from 30 countries gathered together in the events of this agenda.

The Chairman of the Federation Council of the Russian Parliament S.M.Mironov and the Minister of Regional Development of the Russian Federation V.F.Basargin welcomed the Forum’s participants. V.P.Orlov, the chairman of the Federation Council’s Committee for Nature Resources and Environment Conservation stressed that “water” issue has become a priority in development agenda of the Russian Federation and that regular water forums ECWATECH would help to explore the most innovative methods needed for fulfillment of tasks set by the Russian Government and promote international cooperation.

The general appreciation of ECWATECH by the participants and organizers once again proves that this is a unique platform for search and discussion of various ideas, development of business and long-term business relations.

Information support to the Forum was provided by more than 100 specialized publications and Internet-portals in Russian, CIS and non-CIS countries.

## **IWRA Executive Board Meeting**

**Montpellier, June 5-6, 2010**

International Water Resources Association (IWRA) is a non-governmental international organization of over 300 members from 48 countries, representing mainly scientific, educational and professional organizations and individuals that focus their attention in accordance with the statute on the following issues:

- Development of science-based areas of the global water policy and strategy;
- Development and implementation of methodological approaches and tools for assessing, recording and integrated use of water;
- Improving the planning, management, development, technologies, researches and education at the international, regional and scientific level;
- Implementation of multidisciplinary forum, aimed and dedicated to water issues;
- Generate, inventory and distribute knowledge and information on key issues of water and associated resources, as well as the environment.

In accordance with these directions, the IWRA Board organized their meeting immediately after the the 6th World Water Forum's Kick-off meeting, which was to a certain extent, the specific aspect of the elaborating the principal directions of the global water strategy and policy. According to the submitted report, the IWRA Board was not prepared for a particular focus of the Forum on the set of practical

guidelines that should unite the world in their efforts to survive in the current volatile situation (Unlike the past Forum, which mainly focused on the problems rather than solutions oriented to the future).

Therefore the IWRA Board has devoted considerable attention to elaborating essential propositions that may reflect the global interests of water users, water management organizations, environmental centers, decision-makers, academics and practitioners in ensuring the survival of humanity in the face of future challenges.

Four main directions should be recognized and developed as fundamental within universal measures on water crisis overcoming.

*Water governance* was recognized as determinative in creating the base and platform ensuring sustainable governance and development of water management. Board members reviewed the determinative document "Water Governance" submitted by Prof. V.A. Dukhovny and in principle agreed to it as a subject for further thinking and development. The scheme of water governance (WG) influence on IWRM and simultaneously on adaptation to the destabilizing factors was discussed in detail. At the same time *water governance* (WG) is considered as the complex of long-term strategic views (strategy and policy), organizational base, legislative, financial and ethnic aspects along with ecological and social principles defining regulation and rules of interaction of all stakeholders, decision makers and entities defining the possibility of stable satisfaction of social and environmental demands of water. Herewith It is important that *public participation* is recognized as equitable water management and use.

*Integrated water resources management* (IWRM) - annual and operational, long-term and perspective - is the united approach to improvement of water resources management and use. These management principles are known as: hydrographical method, public participation, water and land resources integration, intersectoral integration, water hierarchy integration of all levels, recording of all kinds of waters, direction to achieving the potential water productivity of various water uses. IWRM per se is the sufficient universal tool because it allows to consider impact of the destabilizing factors such as climate change, demographic and industrial growth, increase of hygroegoism, etc.

Indeed IWRM is nothing like governance, which is always balancing, by *managing water supply and water demand*. That is why it is adaptive, because, given the fluctuations - increasing or decreasing the water resources - it contrasts the resources variation to uses management (decrease of drainage water and groundwater use in dry years, and in contrast to it, the use of excess water in dry years; over-year regulation by reservoirs; and planning of area for repeated harvesting in wet years), etc. Moreover it is adaptive because it has the risk management, water allocation in wet years by water circle, increase of water delivery to deltas in dry years, and determining the ecological minimal releases in dry years.

This IWRM in the development of which the IWRA and GWP have played an important role, unfortunately, is often replaced by fragmented projects, which sometimes mislead public opinion in regard to the recognition of IWRM.

The IWRM base is mobilization of efforts, skills, experience, financial and human resources at all levels, in combination with use of main tools of *water governance* which allows to negotiate interests of the whole water hierarchy and horizontal users on the basis of mutual benefit and "no damage" principle. Proper upward implementation of IWRM shows an enormous impact on the achievement of reasonable use of water, on reducing the costs per unit, and especially on demonstration of possibility (and necessity) to apply the absolutely new approaches.

The third key direction of improvement is development and capacity building of water management. It includes a wide spectrum of preserving the existing infrastructure potential by means of appropriate financial support and capital allowances, reconstruction, and also innovations and modernization by implementation of SCADA, GIS, computerization and modern technologies. Information system development, information exchange, "know-how" transfer and acquirement of communication and information technologies are also important for capacity building.

This capacity building should concern not only water management organizations but all water users who should be involved in both creating and developing the WUAs' potential, and their owner. In this context, IWRA Board's members were suggested to consider these proposals and submit them jointly with the IWRA President at the next Board meeting in the beginning of July in Beijing.

The Board also considered several other issues:

- the procedure for 4 IWRA awards nomination, which should be awarded during the previous Congress and the announcement at the end of the current year;
- preparation for the IWRA Congress in Brazil;
- increasing the IWRA members;
- about printing publications by IWRA.

The Board also considered the budget and preparation to the Congress in Brazil.

## **6<sup>th</sup> World Water Forum Kick-Off Meeting**

The inauguration ceremony of 6th World Water Forum to be held in March 2012 in Marseille, was held in 2 June at the Elysee Palace (Palais de l'Elysee). The members of the WWC's Board, the diplomatic corps, leading experts from international and national organizations operating in the water sector were invited to this event.

Prof V.A.Dukhovny, Director of ICWC, Board member of the World Water Council, Mr. N.Sh. Ernazarov, Deputy Chief of the General Water Management Department at the MAWR of the Republic of Uzbekistan and Mr. B.Alloev, the Ambassador of Uzbekistan in France attended the opening ceremony as representatives from Central Asia.

Mr. Nicolas Sarkozy, The President of France, in his welcoming speech, has noted, that France is proud of achievements in water management, water industry, and therefore initiates with pleasure organizing the Forum. He has appealed to "make water as protected resource in order to distribute it inside a country and among countries". He emphasized the role of Marseille and its mayor - Mr. Jean-Claude Gaudin, Vice-President of Senate, who made Marseille as a leader of water management not only in France but also in the Mediterranean region. Mr. Sarkozy has expressed the hope that preparation and conducting the Forum will allow to strengthen international cooperation in the water resources management and use, and will ensure the achieving of the Millenium Development Goals especially aiming to combat hunger and poverty, and to ensure access to water. Mrs. Chantal Juanno, the State Secretary of the Ministry of Environment, Mr. Gaudin, Mayor of Marseille, as well Mr. Loic Fauchon, the President of the World Water Council, have adressed their speeches to the participants.

The main event was in next 2 days in Marseille. Opening the meeting in the Palais du Pharo, Mr. Gaudin said that Marseille has a history of 1600 years. This is a history of fight for karst water coming to city from long distance, and of fight with constant sea water effect on urban territory. But the city is successful in the water and sanitation management and the wastewater treatment and reuse as well protection of shores and coastal area. The water management of the city and the Provence province cooperate successfully with many of neighbors from the developing countries of Northern Africa in the Mediterranean region, assisting them to improve water supply and sanitation.

The aim of staying the WWC in Marseille and attention of city's and province's administrations to WWC's activity is to transform Marseille and the large scientific centers in Montpellier, Toulouse into the World Water Center of the Globe. We are proud of the voice of Marseille which is being listened by all of the world and we are sure the 6th World Water Forum will help to overcome the world water crisis.

Mr. Loic Fauchon, President of WWC, described the features of the water sector development in the world. With all the efforts of governments, international financial institutions and the world community more than a billion people lack access to water, and more than two billion people - to normal sanitation. Achieving the Millennium Development Goals becomes very problematic to 2015, since the financial crisis has strongly affected the poverty alleviation and decrease of hunger. Number of people living on less than one dollar a year, has doubled in recent years. Within this problem a water for irrigation is very important because investments and increasing of irrigated lands are reduced sharply. In these conditions the governments and IMF have to be addressed to problems of water saving and increasing of water productivity.

The State Secretary of the Ministry of Environment has emphasized that the French government consider a water as a social benefit and not as only an instrument of economical growth. The water volume on the planet for one person will be much less to 2030. At the same time 90% of the population will live in transboundary river basins. In order to enhance the equality in the allocation of waters of international watercourses, France officially will join the UN Water Convention soon and appeals to other countries to follow them. Human rights begin with a water, so be on the eve of the Forum, the main attention has to be focused on ensuring the legal rights to water for drinking, domestic use, food production and environment need.

Dr. Ben Braga, Co-Chair of the International Committee of the Forum, Vice-President of WWC, announced that the co-chair of the Committee from the Government of France is the Head of the President's Staff. The main focus of the Forum, unlike previous ones, should be not the emphasis on existing issues, but on specific actions to overcome water shortages, unmanageable water, violation of nature needs and rights to water. The Road Map should consist of engineering tools, innovations and political actions (related to each other) of all countries of the continent. In advance of the 6 WWF the people's enthusiasm is needed and a clear order to the decision makers is to be given as follows:

- development has to be based on the professional analysis;
- impossible movement according to the business-as-usual scenario;
- modernisation of the whole water sector;
- impossible modernisation of water use within existing organizational structures;
- establishing sustainable financial mechanism;
- water saving;
- progress can be made only with political will and support.

Mr. Andras Szollosi-Nagy, Chair of the Political Process of the Organizing Committee has presented the Action Plan which is aimed to create the global political water platform:

- involving the mayors of cities to join the Istanbul Water Consensus;
- organizing the parliamentary group on strengthening water governance oriented to formation of the Global water parliament;
- improving the understanding by governments and ministers of needs to elaborate the water strategy on the national and regional levels and to join the water conventions;
- organizing the ministerial process on preparation to the Forum.

The World Water Council through a working group on transboundary issues will prepare a series of recommendations, documenting best examples of current practice, progress, and strengthening cooperation on international watercourses, what will contribute to economic growth, conservation of nature and strengthening water security.

Thematic Committee presented to consideration of participants 10 main themes of the Forum:

- strengthening water governance
- access to water and sanitation
- rights to water
- climate change
- balancing multipurpose use
- best practice and creation of potential
- transboundary problems
- water and food
- management of risks and catastrophes
- innovations for extensive use.

## **Official Announcement of the Preparation for the 6<sup>th</sup> World Water Forum in Marseilles: Speech of the French President**

Elysée Palace, 2 June 2010

Dear President of the World Water Council,

Dear Vice President of the World Water Council,

Dear Ministers,

Dear Minister of the Water Resources of the People's Republic of China and Minister of Environment and Forestry of the Republic of Turkey, who have honoured us with your presence,

First, let me welcome all of you in Paris, in the Presidium, and express my appreciation for the acceptance of our invitation to visit Paris on your way to Marseilles.

Today, we share a grand and pleasant moment, since France and its city of Marseilles have been selected by the World Water Council for holding the 6<sup>th</sup> World Water Forum in March 2012. We are very glad of that, and I would like to thank all who gathered here and took part in and promoted gaining such an opportunity of holding the Forum in France.

However, this moment is still extremely serious, since the water issue is associated with very difficult challenges of the current millennium.

Notwithstanding the abundance of clean water running in every home of our country, we must not forget that, at this instant, there is shortage of water in many regions of the world, and that water is polluted. One child dies every 15 seconds in the world because of water pollution. At present, water kills more people than wars, starvation, and AIDS do.

Nowadays, in many parts of the world, water is short for land irrigation, power generation; while electric power, on its turn, is not enough for the production of drinking water. Today, in many regions of the world, there are disastrous consequences caused by drought, and floods play havoc.

Opening formally, together with you, the process of the preparation for the 6<sup>th</sup> World Water Forum to be held in Marseille in March of 2012, I would like to share my opinion. I know you realize that the water problem is very urgent. This is a problem of this century, since future of water determines, quoting the title of the last work by Érik Orsenna, the future of people.

A water forum is a place of decisive meetings for all of us: this is point to identify the place of water in the international policy – in the front line.

In my opinion, our country, taking into consideration all its experience, has deserved the right to become a place for holding the next Forum. This is experience of the country that has a law on water since 1964; has basin committees, those “water parliaments”, which, to some extent, anticipated the bodies and management of the Grenelle Environment Conference<sup>1</sup>.

We have strong water standards. We are the country where the water market has a turnover of over 15 billion Euros and mobilizes more than 110 thousand working places. We are the country that has three world French leaders in the water engineering and water supply and sewerage services, two of which rank first by rights among such enterprises in the world. Finally, we are the country that have managed to turn the processing chain “water and purification” into the most developed, and this is thanks to water services and their ability to produce tap water of very high quality.

With such experience, we are going to organize the meeting in Marseille in 2012; in this magnificent Mediterranean city, open for ther whole world, where different cultures have become intertwined, in this lively, vivid, and hospitable and which, by the way, is to be announced the European cultural capital in the year following 2012, i.e. 2013.

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<sup>1</sup> Named on the analogy of the first multi-party meeting on special issues, which was held on the Grenelle Street in 1968.



Moreover, there are not so much places like Marseille and Provence where the water value is well acknowledged. Please be aware that tomorrow the Mediterranean basin rivers countries around you will have not more than 1 % of the fresh water available in the world. It only remains to compliment you Mr. Mayor, dear Jean-Claude Gaudin, for your efficiency and your persistence. I know how much efforts, resoluteness, and boldness it took of your city to nominate itself as a candidate for the Forum venue.

We would not be able to hold this meeting single-handed. Even if I am happy that the France candidature has won, I would like to closely cooperate in the organization of the Forum with South Africa, which also proposed its Durban city as a candidate for the 6<sup>th</sup> Forum. I would like to mention what great importance we attach to the participation of the entire African continent: at the beginning of this week, France is to hold the France-Africa Summit.

In this context, I call for everybody, for whole your will, and all your experience. I address myself to our forerunners who used to organize world fora: Morocco, the Netherlands, Japan, and Turkey, of course, which also proposed its splendid, like a treasure, Istanbul city for the 5<sup>th</sup> World Water Forum. I would like to point out though that it is Turkey that is passing the symbolic function of the organization of the next World Water Forum to us. I hope that it will be France that will pass the baton for the organization of the UEFA European Football Championship to Turkey after year 2016.

The 2005-2015 decade is the UN decade going under the motto “Water is Life”. Five years have already passed, and the following figures dispirit us, I will admit:

- 1 billion people have no access to drinking water;
- billion people have no access to sewerage system;
- 8 million people, including children, die every year from the consumption of polluted drinking water.

These data are as alarming as the fact that water is at the crossroads of all world challenges: demographic growth; urbanization; pollution growth; climate change; ecological and economic crises. Development, let alone sustainable development, is not possible until the water problem is solved.

My first view concerning the process we are going to conduct on the threshold of the 6<sup>th</sup> World Water Forum is simple and, at the same time, complex: make water a protected resource so that to enable its allocation both within countries and among those.

Thus, we undertake the task of reasonable and joint management of water resources. For that, we need to place the water issue into the spotlight of all political lines.

This suggests me another view of principle: the World Water Forum in Marseille will allow adopting and forming universal right for water supply and sanitation facilities.

This is the reason why France has doubled its financing to water supply and water treatment in the form of government's international aid since 2005.

The government is not alone in this cooperation. Thanks to the law of 2005, named OUDIN-SANTINI, concerning decentralized cooperation, local government institutions and water management bodies can perform their appropriate functions on a solidarity basis in the South cities and villages. Owing to financing by France, additional 2.5 million people of developing countries got access to water and sewerage by 2008.

When France takes the chair of the Group of Eight and the Group of Twenty in 2011, we will put the spotlight on the water issue.

I would like the oncoming Forum in Marseille to become a process that would make a completely new emphasis on water and be open for all participants, on the analogy of the Grenelle Environment Conference in France which brought together non-governmental organizations, administrative and territorial units, businesses, different unions, and countries.

As for France, the government, deputies, administrative and territorial units, associations, and entities united into French partnerships that deal with water resource issues; they all are mobilizing for applying such a management method that has been and still is a true guarantee of shared success and common wealth on a huge scale. Water – easily or hardly – flows across countries: I would like a dialogue without borders, bans, and barriers to take place in Marseille in 2012. I count on all of you in the achievement of true success in these measures.

I wish you all substantial and fruitful work so that the Forum preparation, which we are going to announce officially today in Paris and tomorrow in Marseille, would result in taking mutual responsibility for water management – this is a challenge of our time and for the future of the world. So that all people, as René Char said, would become people of “unembittered day and purling water”.

Thank you.

## **39<sup>th</sup> WWC Board Meeting**

Such rapid convening of WWC Board meeting after the inauguration of the 6th World Water Forum in June by Mr. Nicolas Sarkozy, President of France, and the ensuing discussion of the proposed topics of the Forum is caused by the circumstance that virtually the preparation to the Forum as compared with previous ones, especially with 3 WWF in Kyoto, delays considerably. Therefore, the preparation of the Forum and the implementation of the preparatory campaign demanded an immediate (just 20 days later) holding the next meeting of the Board, which under the invitation of the Ministry of Water Resources of China took place first in Beijing on June 24-25, and then ended in Shanghai on 26-27 June.

Mr. Chen Lei, Minister of Water Resources of China, welcomed the opening of the Board meeting. Mr. Hu Siyi, Deputy Minister, outlined the main directions of the water management development in the country. He stressed that the Ministry now has developed a new strategy of activities, where the peculiarity of the current situation in water management is reflected:

- steady increasing of extreme events under the climate change impact. Nearly every year country suffers from the devastating floods, which follow periodic droughts. And this year, just now, during the Board meeting in the south-west of China are enormous floods, mostly on small rivers, which killed hundreds people and thousands villages were evacuated. If the country's main rivers are regulated (Yangtze, Yellow River), then the numerous of small and medium-sized rivers, especially in the monsoon zone, are characterized by large natural flow fluctuations, resulting in attracting significant investments, particularly for regulating of tributaries and upstream sections and flood protection works along the river beds;
- increased attention to the guaranteed water supply especially in dry areas, led to development of the flow diversion from one basin to another, which allows to adjust water availability in years with different wetness. The largest effort is the first stage of construction of the South-North canal;
- intensive investments to infrastructure are accompanied by an increased attention to the water demand management, which is being developed by the Ministry through the decentralization of management, transfer it to the regional organizations and water user associations under the strict control of the Ministry in accordance with approved government tasks on rational water use;
- the Government in every way promotes the construction of hydropower structures within small hydropower, where China has a leading position in the world, as well in construction of hydropower stations in the country and abroad. Currently, China's firm "Sinogidro" builds 60 new large hydropower plants in the country and more than 100 ones abroad, owing to development of hydropower industry in the country.

Mr. Loic Fauchon, President of the WWC Board, presented such main tasks of the Board activity as the Forum preparation, which is entrusted to the International Committee of the Forum, and focusing the whole water community on the growing water crisis. The WWC approved the work program for the next 3 years, which should be developed in cooperation with members of the Council and national water communities. It includes four major areas that should be implemented constantly and correspond to the World Water Forum ideas:

- ensuring the policy on improving of water supply, sanitation and water resources management (political process);
- strengthening the involvement of main water organizations into solving global water issues (thematic process);

- strengthening regional cooperation for achieving water security and economic development (regulation process);
- mobilization of citizens and users to overcome the water crisis (communication process).

Regarding first issue, the Council organized the work of approximately hundred mayors who have signed the Istanbul Water Consensus. Up to 1000 subjects is supposed to be covered by members of the Council.

In addition, it is proposed to organize a work group of representatives from parliaments of all continents in the World. The meeting of parliamentarians from the Middle East is already prepared which will be held in Beirut.

Concerning the second issue, the agreement on joint activity between the WWC and the International Water Association (IWA) which represents the interests of the water management business and reflects the prospects for joint work was signed in Shanghai. The work group on adaptation to climate change is organized. Its leader - Mark Smith (IUCN) - presented a brief report on the results of the Copenhagen Summit, which almost resulted in disappointment of the global public in the world's leaders.

Regarding the third issue, Prof. Dukhovny V.A. prepared a note outlining the concept and the work plan. It was sent directly to the Board and the Board's members 2 months ago. Mr. Fauchon, President of WWC, stressed the need to accelerate response to the proposal.

Regarding the fourth issue, the WWC has prepared the World Water Pavilion at the Expo 2010, which was inaugurated in Shanghai, in the presence of the Board members who will attend the Singapore Water Forum and the Stockholm Water Week and will advocate the WWC's strategy and give it to the media.

Prof. Ben Braga, Vice President of the WWC, Chairman of the International Committee of the Forum, jointly organized by the WWC and the Government of France, has reported on the Committee's structure composed of 11 representatives from the WWC and 11 representatives of the Government. The Committee has formed the Bureau of 4 people: B. Braga, O. Gauthier (Ministry of Environment of France), Martin Vassal (Deputy Mayor of Marseille) and A. Szollosi-Nagy (UNESCO, member of the WWC Board). The Committee appointed four heads and deputy heads of advisory bodies:

- the political process - the head: P. Lacoste, Ministry of Foreign Affairs, the deputy head: A. A. Szollosi-Nagy (WWC);
- the thematic process - the head: D. Altinbilek (WWC); the deputy head: P. Lavarde (French National Water Society);
- the regulation process - the head: E. Park (WWC), the deputy head: M. Bernard (French Development Agency);
- the communication process - the head: M. Vassal (Marseille), the deputy head: H. Kennou (WWC).

Mrs. Vivian Rofort was appointed the Committee's executive director.

Like the previous Fora the whole process of preparation and realization of the Forum is formed as a political, thematic, regional, and information processes, which should be developed on a single basis and within a certain direction.

The previous fora were aimed to increase understanding of the whole society about water problems, the growing water crisis and the corresponding need for the global community's efforts in overcoming the future challenges. These goals can be considered as achieved, because understanding the severity of the water situation is available throughout the world by all people. Key issues and challenges have been investigated sufficiently clear. These are as follows:

- climate change impact on both increasing water supply caused by temperature growth and frequency of extreme water events;
- demographic pressure resulting in the increase of water demands and needs to special focus on the water management in the cities because of extending urbanization impact both on water supply and sanitation, and water quality;
- increasing financial deficit for water management development and support because of economic crisis;
- strengthening globalization and commercialization of water management;
- poor water security of water regions caused by un-cooperation on transboundary water bodies sometimes having the political pressure.

Forthcoming Forum has to become Forum of actions, decisions and elaboration of platform to be presented to future generations.

For this purpose all 4 processes - political, thematic, regional and information - have to be based on the single perspective platform and one way.

The sharp debate was concerning the themes of the Forum. The traditional approach to defining the Forum's themes at the Conference, where participated representatives of various organizations (over 380 members), have been applied and themes corresponding to the wishes of the participants were selected. However, given the different interests of participants from NGOs belonging to water and related to water sphere, representing poorly water users and water professionals, a set of themes according the questioning was very cumbersome and inconsistent. They included both specific topics and again the sectoral problems, which would hinder the one way development of the Forum.

The International Water Resources Association (IWRA), presented in the Board by Prof. Dukhovny V.A., Director of SIC ICWC, and Mr. Xie Jun, President, have considered after the first debate in Marseilles these themes and supported the proposals worked out by Prof. Dukhovny V.A., concerning 4 main directions of future water development, which were presented in the form of a note to members of the Board of the World Water Council.

Instead of 17 topics, of which 5 represent sectoral interests, and 6 - the current problems, it was suggested that the Forum has to be concentrated on development of four principal platforms, 3 of which coincide with those given at the last debate in Marseilles. They allow to control challenges of future water crisis and to create "tree of goals" reflected both sectoral interests and counter the destabilizing factors, as well as to integrate measures, activities etc. These 4 areas are as follows:

- *Water Governance* – as a set of rules, regulations, policies and guidelines that form political, legal, organizational, financial and economic basis for state and interstate relations system in combination with social relationships and ethnic standards. Regarding the *management* and *development* the role of water governance must be understood as the basis of initiatives and constraints within which the "management" is responsible for implementing the principles of sustainability, and water governance includes *public participation*, and the rules for *transboundary waters* use are very important;
- *IWRM* – as a combination of management of water supply and water demand. IWRM is also focused on *transboundary water resources* and its use that play a major role for the basin states. In this regard, it is desirable cooperation between States in accordance with existing agreements and / or other relevant arrangements, taking into account the interests of all basin states and a set of measures that will be prepared within the framework of Water Governance.

The following program areas for the sector of fresh water within IWRM can be proposed to the Council:

- a) implementing the integrated water resources development and management;
- b) protection of water resources, water quality and water ecosystems;
- c) drinking water supply and sanitation;
- d) water and sustainable urbanization;;
- e) water for sustainable food production and rural development;
- f) climate change impact on water resources.

Such vision of water demands for food, industry, water supply, nature will avoid fragmentation of water management organizations and connect them within the IWRM approach, when the requirements of water demand management (USV) of all these sectors will be integrated properly, fairly evaluated and incorporated into the overall evaluation of all water resources (transboundary surface waters, groundwater and return flow, local waters, national and others).

*Capacity Building* (CB) is a very important subject, which allows to maintain the stability of infrastructure on the basis of the established order of restoration, innovation, modernization and involvement of real players who can implement the advanced technologies on the hydraulic units and irrigation systems, as well SCADA system, computerization, etc.

Development of information systems with a set of models and training materials will be a great contribution to the National Program of any region where there are similar needs. These measures should be prepared for different levels of water hierarchy, but this must be done so that the tools for all levels of the hierarchy are linked by a methodology and they must serve to the combined and complementary interests of each level.

*Human resources development* is the most important part of future activity, which should establish stable relations not only between experts, but also throughout the society in relation to water and can develop abilities to cope with water crisis around the World. This part of the water platform is divided into two main components - the human resources of society in general and professionals resources.

*Development of human resources* of society should be directed to all people, especially the younger generation, who have to deal with and adapt to all water problems and who needs the force to meet and deal with this situation. This implies that education, from kindergarten, to schools and other educational institutions should include developing an understanding of the water as a sacred gift and not a commodity, knowledge about water shortages, extreme water events awaited in the future. New generation must overcome all the abovementioned problems. Here are three crucial important programs - "Water and general education," "Peace, prepared for the Water Crisis" and "Everyone is responsible for water - water and ethics" - to create an updated social consciousness and capacity to adapt to this risk.

*Development of human resources for water sector* should be aimed at water professionals in governmental water management organizations, non-governmental organizations and local public organizations, such as water boards, water user associations, and similar organizations of water and land users. The professional activities should include:

- A program of future water leaders;
- system of continuous training for WMOs and stakeholders;
- ensuring sustainable financial position of the staff in these organizations.

*Political Commission* intends to do the following:

- to continue the political dialogue initiated in Istanbul, but in a broader perspective;
- to involve various levels of water governance;
- closely linking its work with the thematic and regional commissions;
- to involve the government representatives into the current work because involvement of representatives of the embassies into the Istanbul process has greatly reduced its effectiveness; to exchange opinions;
- to follow mainly the UN's progress through the program "UN Water", developing dialogue with participants;

- not to attempt achieving a consensus with the Ministerial Declaration - this will not be a real result, as the experience of Istanbul showed, but to stake the recommendations of the international community for ministerial level of water management.

During the discussion it was clearly pointed out that the political process should be oriented on development of RIO + 20 principles, the Millennium Development Goals and commonality of water problems. It is desirable to develop the fundamentals of international water code and give it to political community for discussion.

The Board has set the further action's plan on the Forum preparation:

- The International Committee of the Forum each month will inform the Board members about their achievements, and will exchange opinions with us in the form of electronic conferences;
- The ICF's staff will be heard in August in Stockholm, and then in October - at the next Board meeting in San Francisco;
- Paris will host a conference of "stakeholders" on 18-19 November;
- Consultation with political leaders will be held on 18 - 22 March 2011.

The *Board* announced the Competition for the holding of the Seventh World Water Forum; the tender commission is organized; the first offers have been received from South Korea.

In conclusion, L. Fauchon noted the following:

- start the broad dissemination of ideas of the Forum;
- establishing the communication system for the Board's members to involve them into dissemination of ideas;
- to develop urgently a plan for the regional process "continent - the subregion";
- to involve all large international water associations;
- ask the French Ministry of Foreign Affairs to begin consultations with governments of the countries through the embassies.



## **40<sup>th</sup> Meeting of the World Water Council's Board of Governors**

San Francisco, USA, 13-16 October 2010

The regular World Water Council's 40th Board of Governors meeting was held in San Francisco, USA, and was organized by the US Army Corps of Engineers (US ACE)

24 Board's members, 7 alternates of absent members, heads of WWC's headquarters and invited people attended the meeting.

The Board of Governors considered the report on activity and financial situation of WWC for 1st half year 2010, and information about new members (today there are 406 members in the WWC).

The main focus was on the organizing and preparing of 6th World Water Forum which will be held on March 2012 in Marseille.

At the opening of the meeting, Lieutenant General Robert Van Antwerp (US ACE) has welcomed participants on behalf of the Government and introduced the panelists who presented their papers about rules and decisions by USA's water management with the case of California as one of the biggest water users among the states of USA. The discussion was further pursued by panellists:

- Steve Stockton -World Water Council Governor and Director of Civil Works for the US Army Corps of Engineers (US ACE);
- Paul Robershotte - Special Advisor on Integrated Water Resources Planning (US ACE);
- Lester Snow - Secretary for Natural Resources for the State of California;
- Michael Connor - Bureau of Reclamation, US Dept. of Interior;
- Paul Kelley – President, Association of California Water Agencies.

Loic Fauchon, the President of the World Water Council, has informed participants about his meeting with the Secretary-General of the United Nations, Ban Ki-moon, which was 12 October 2010 in New-York. The Secretary-General emphasized the vital importance he pays to the access to water for all in the battle against poverty - whether it's for food production, fighting water-borne diseases or ensuring the role of women and children in tomorrow's society. He assured Loic Fauchon of his personal commitment to the cause and congratulated him on making the World Water Council an internationally recognized and respected organization in such a short time. Ban Ki-moon and Loic Fauchon discussed different pathways for future collaboration on transboundary waters, the overcoming a tension between water and energy, as well preparation for the Rio+20 Earth Summit in 2012.

The report on activity for the 1st half year was presented by Mr. Ger Bergkamp, Executive Director, and was supplemented by other heads of some activity directions.

Mr. Jean Paul Rivard, representative of the Ministry on Environment, emphasized that ahead of the forum the Government and Senate of France have prepared the decision on joining to the UN Convention 1997 on "the Non-Navigational Uses of International Watercourses" and the appeal to the European Parliament on initiation of adoption of all EU Members to that Convention.

The FAO's representative, Mr. Daniel Reno, reported on development of the Program "Water and Food" under the leadership of P. Stedutto, working group manager. Special attention was given to this issue in connection with great decrease of food production in some areas of the world in the past and current year that caused increase of price firstly on wheat. Therefore new interest to irrigation and its sustainability is increasing worldwide. The work on this direction was supported by the representative of China, the President of the World Water Resources Association and the President of the World Water Council.

Mr. A. Iza has reported on adaptation to climate change and emphasized that special attention was given to analysis of floods in Pakistan which caused catastrophic damage to the country amounted billions dollars, as well he stressed that all Governments has to pay more attention this catastrophe. Particularly, Mr. Priscoli, representative of the US Army Corps of Engineers, noted that american juridical organizations have adopted decision on increasing of characteristics of the large hydraulic structures and bank protection embankments to 10 times up to 0.1% probability, and have decided to take inventory of all existing structures to meet those requirements.

Mr. Ksia, President of the World Water Association, has reported on multiple uses of water. He noted that multiple uses of water under integrated approaches must be directed firstly to irrigated agriculture. Using 72 % world water resources, irrigation practically is already multipurpose because irrigation water is used for homestead land irrigation, watering of trees, developing of fishery and simultaneously ensures comprehensive development of the territory. In the Northern China's Valley the multipurpose use of water became the key aspect of water use improvement. At the same time special attention is paid to accurate water service, water monitoring, water price and assessment of non-productive water use. All these things have led to water use priority but not to water delivery priority in Chine.

V.A.Dukhovny together with the co-chair of the work group for transboundary water Mr. A.F. Metavi (Egypt) reported on transboundary water resources. They stressed a need for stirring up of the work group's activities that were stopped due to leaving by A.Nickol from the post of the head of Coordination department. The Concept Note and proposed work schedule of the work group that were presented during the last Board's meeting have not been agreed and approved by the Headquarters. As a result, activities of the work group were performed under under the auspices of other international water institutions. Particularly, discussion was initiated of proposals and Concept on transboundary water within the framework of

the International Water Resources Association (IWRA), which approved this document. The latter is to be published in the next issues of the Water International Journal. Proposals on the work group were also submitted to the European Commission for Eastern Europe, Caucasus, and Central Asia, which organized preparation of the guidelines on application of the Conventions 1992 and 1997. A representative of SIC ICWC was included into this preparatory group.

High emphasis was placed on preparation to and organization of the 6<sup>th</sup> World Water Forum. The Board approved the key guidelines and persons responsible for thematic, political and regional processes of the Forum.

When discussing the regional process, the EECCA Region was defined as the special group in the European Program which will be financed by the French Government through the International Basin Organizations (INBO). Mr. Jean-Franco Donzier was assigned in charge of this program.

The second consultation with water public community on organizing the Forum will be held in the first half of January 2011.

The commission on selection of country for hosting the WWF in 2015 is established. Some proposals on organizing the 7th WWF are already received from: the President of the Republic of Korea, the Prime-Minister of Scotland, Johannesburg, and the Chairman of the Executive Committee of Abu Dhabi (Arab Emirates).

## **A few Aspects of the United States Experience in the Improvement of the Water Resources Management**

The California state is one of the most stressed regions of the U.S.A. in terms of water resources availability, which is permanently subject to the alternating impacts of floods and droughts. It is significant that the last three years (2007, 2008, and 2009) the flow probability in the rivers feeding the state was from 53 to 65 %, which was a cause of charging the reservoirs from 57 to 78 %. Such a decline in the water supply level happened after abrupt water surplus in 2006, when the river flow exceeded the value of 170 % of the long-term annual average. That caused sharp increase in focusing attention of the management of both the state and the country in whole to the water availability problem, which influenced the ad hoc decision of the U.S. President B. Obama in September 2010 concerning the development of special measures aimed at the improvement of water resources use and environmental safety of the state. Along with that decision, the Supreme Court of the state adopted the decision and approved a new regulation aimed at reduction of water consumption by all sectors of the economy by 20 % on average and release of that water for feeding the San Francisco delta and bay. Moreover, with the purpose to restore the fish fertility, in particular sturgeons the fertility level of which has

dropped to the lowest level for the last 50 years, great measures aimed at the reconstruction of almost all large structures on the San-Joaquin and Sacramento rivers are planned. Construction of fish conservation works and bypass channels is provided for; the total cost of that exceeds one billion US dollars per year. One of main ways of water resources saving is Integrated Water Resources Management with wide involvement of society, thanks to which substantial progresses are supposed to be achieved in the improvement of the environmental and social welfare of California by 2050.

All these measures are reflected in the Federal Plan of Actions on the California bay and delta prepared by the U.S. Army Corps of Engineers and approved by the Congress in 2010, as well as in the California Water Pumping Plan signed by the California State Governor Arnold Schwarzenegger. As one of important measures aimed at the execution of these two documents is involvement of the Association of California Water Agencies, which united all irrigation districts existing in the state, Municipal Water Users Association, U.S. Army Corps of Engineers offices, and U.S. Bureau of Reclamation, for carrying out control and coordination by means of this semi-public organization.

## **Capacity Building in the Integrated Water Resources Management and Planning in Central Asia**

A regional seminar on Capacity building in the integrated water resources management and planning in Central Asia was held jointly by SIC ICWC and UNESCO-IHE Institute for Water Education in the Business Center Poytakht on June 7- 15 2010. The aim of the seminar was training of trainers in following four areas:

1. Integrated Water Resources Management (IWRM);
2. Improvement of Irrigated Agriculture (IIA);
3. International Water Law and Policy (IWLP);
4. Regional Cooperation in Transboundary Rivers (RCTR)

Based on previous studies on the problems of the ASB and their solutions, as well as subsequent developments to identify priority areas of organization and development of shared transboundary water resources management, ICWC approved four thematic blocks, interrelated by a common purpose of strengthening regional cooperation in the basin.

At the opening ceremony of the seminar Dr. Umarov P.D. (Deputy Director of ICWC, Director of TC ICWC) delivered a speech. He welcomed participants and introduced the aim of the seminar.

In his speech, Dr. Umarov P.D. talked about the creation of the capacity-building program for water specialists through the Training Center of ICWC (TC ICWC) which was established in 2000 at the initiative of ICWC and with financial support from the Canadian International Development Agency (CIDA). The Training Center conducted comprehensive regional training program for upper and middle level specialists on priority areas identified by ICWC members: IWRM, IIA, IWLP and RCTR. After the completion of the project in 2005, TC ICWC did not receive any financial support and could not function on an ongoing basis for a long time.

During this period, TC had been periodically conducting regional seminars for one-time programs of the European Union, NATO, OSCE, FAO, etc. until the UNESCO-IHE Institute undertook to support this initiative and found some means so that TC could generalize all the previous experience and develop training modules on the abovementioned four areas which could be further used in the countries as a tool for conducting profession development on a continuing basis. To participate in this project ICWC members identified four experts as future trainers from each country, which, with their focused specialization in one of the above four areas, could both be ready to discuss and participate in the discussions on the remaining three blocks. In order to develop these blocks assessment was carried out and based upon its results the best specialists with many years of regional experience were selected to prepare appropriate training modules on each of these areas. This work was done quite thoroughly and the composition of modules was carefully studied. Moreover, their contents were written to be discussed at the orientation seminar with future trainers from each country.

In accordance with the seminar program (Annex 1) after the introduction of participants (Annex 2) Dr. Umarov P.D. called on Dr. Krishna Prasad, senior lecturer at UNESCO-IHE Institute for Water Education to speak.

In his speech, Krishna Prasad pursued two main objectives:

- to convey the basic idea of SIC ICWC and UNESCO-IHE project; and
- provide information on UNESCO-IHE

The aim of the project is to have a broader look at the project and develop cooperation in this sphere between the countries after the end of the project. The project focuses on training, education and research in the Aral Sea region. In his speech, Dr. Krishna Prasad outlined the main goals and objectives and expected results of the project. He also talked about the history, functions and objectives of UNESCO-IHE.

After the opening speeches by Drs. Umarov P.D. and Krishna Prasad, classes began in the general auditorium, i.e. with the participation of four area specialists. Coordinators of each of the blocks delivered an introductory lecture, which briefly described the structure and content of their courses.

Rysbekov Yu.Kh. – coordinator of Block 3 «International Water Law and Policy». The Block consists of 12 modules and focuses on enhancing regional cooperation in terms of: strengthening of trust and mutual understanding between nations by

improving the tools of the negotiation process on the basis of adherence to international water law in the integrated management and efficient use of water resources at the interstate and national levels to meet social and economic demands of the population of the entire region. Rysbekov Yu.Kh. familiarised the participants with the block structure and thematic content.

Sorokin A.G. – coordinator of Block 4 «Regional Cooperation in Transboundary Rivers». The Block consists of 5 modules and focuses on strengthening regional cooperation in transboundary rivers in terms of: application and development of best international and regional practices in integrated management, operational and long-term planning, reducing unproductive runoff losses, increased use of measuring and modeling instruments at the interstate and national levels to meet social and economic demands of the population of the entire region. An emphasis should be given to the use of economic mechanisms in the relationship between countries.

The presentation by Sorokin D.A. supplemented Block 4. In his speech, Sorokin D.A. provided information about the CAREWIB portal - regional information system on water and land resources of the Aral Sea, which is designed primarily to support decision making in the water sector in Central Asia.

The main objective of IS is to create a integrated system for accounting land and water resources of the Aral Sea basin, with the possibility of assessing various aspects of their efficient use and forecasting, which will promote sustainable management and control over all kinds of water resources.

The system makes it possible to allows continuous evaluation of the efficiency of water for all types of use and identify unproductive losses.

The information system, shared by riparian states, promotes trust, solidarity and a sense of mutual responsibility. Data are available from 1980 to the present, (time interval: annual - seasonal [vegetation / non-vegetation] - monthly). In general, the information system includes more than 150 parameters.

In the course of discussion after the speech by Sorokin D.A, participants have expressed great interest in the work of this portal. Dr. Umarov P.D. emphasized the importance of CAREWIB as a tool to strengthen regional cooperation that needs to be learnt.

Mirzaev N.N. – coordinator of Block1 «Integrated Water Resources Management». The Block consists of 8 modules and is aimed at strengthening regional cooperation through the organizational and technical improvement and management of water resources through: improving the organization of water management and irrigated agriculture, with the involvement of water users and stakeholders; use of technical and financial tools to improve water and land management at all levels of water hierarchy; improvement of the legal framework of the ongoing reforms in agriculture and water management at national level. The implementation of IWRM at the basin level plays an important role.

After the speech of Mirzaev N.N. during the discussion gender issue was raised. Participants concluded that the involvement of women in water management is necessary.

Khorst M.G. – coordinator of Block 2 «Improvement of Irrigated Agriculture». The Block 2 consists of 8 modules and is aimed at saving and economic use of water based on: the implementation of IWRM and improvement of water and land productivity focused on achieving their potential level; application of mathematical tools and computer technology in irrigated agriculture; the use of economic and legal instruments to promote water saving.

All these activities should provide the release of water and reduce the load at transboundary level, as measures to strengthen regional cooperation.

To ensure the efficiency of the course all participants were divided into 2 groups: given that Blocks 1 and 2, 3 and 4 share many common issues that complement each other, sessions on these areas have been combined. The classes were held in this way for 5 days. Group trainings were held in an interactive way and allowed the experts to reveal in more detail the main specific issues in both adjacent blocks.

In the course of seminar the participants were familiarized with international and regional practices, discussed in the interactive debate the challenges facing the oblast water management organizations in the region, as well were acquainted with one of the most efficient and popular methods of training - role-playing. In particular, in his presentation Dr. Krishna Prasad outlined the rules of role-playing.

At the end of each module, active discussions were held between participants and lecturers, where the details of various issues relating to each individual country and the region as a whole were considered.

In one of his speeches, Dr. Krishna Prasad emphasized the organization of training at national level by trainers already trained under given project. He also mentioned the need for developing common approach by the participants from five countries

Dr. Umarov P.D. made suggestions on the organization of further training:

- to combine the upper and middle level to ensure practicability and feasibility of holding the seminars, since it is very difficult to organize training at the upper level;
- to pay special attention to the training of the lower level as an important element in water resources management;
- funding depends on the specific conditions of the country, the target audience;
- the implementation of the idea of creating extension services and integrating them with training for lower level;
- provision of state support for training and maintaining the stability of training activity;
- searching new projects that will be interested in conducting training component;
- creation of regulatory mechanism that would allow each area specialist undergo relevant advanced training.

This project aims to train national trainers who will in turn conduct training in their countries, and prepare trainers for the lower levels (oblast, district). The project aims to equip future national trainers with constantly updated extensive knowledge and tools as a full arsenal of modules, from which it will be possible to organize courses adapted to their conditions.

In his speech Dr. Joop de Schutter stressed the importance of continuous building the people's capacity who are involved in water resources management, which requires in the first place strengthening of Training Center, in particular the transition from intermittent training to the training on an ongoing basis. It is necessary to organize trainings that facilitate decision-making in the water sector. The issue of developing business plan, which will define how to organize and institutionalize ICWC training capacity in the future, and identify sources of funding is also closely related to this. It is also necessary to enhance cooperation with existing educational institutions in the region, such as universities and technical schools to exchange information and strengthen the effectiveness of our activities. Achieving the level of integrated decision-making is one of the important goals we are trying to achieve and IWRM is the basis for achieving this goal. In Central Asian water sector a multicriteria decision support, balance the interests of all countries needs to be developed. Central Asia is important geopolitical region, the people who live here, especially the decision-makers must be able to find a compromise and understand the importance of integrated decision-making. Trainers trained in this training course are a key element in achieving the balance between countries in the management of water resources, namely, they will be able to explain managers and all water users the integrated decision-making and how to implement it in practice. Given that there are different target groups, different learning formats should be elaborated. One of the key methods of learning in the training is role-playing. Using the results of the Aral Sea model as a basis for role-playing will contribute to mutual understanding between countries. Joop de Schutter expressed his hope to continue cooperation with these groups.

In his address, prof. Dukhovny V.A focused on the international practice of water resources management. Experience of such organizations as the International Joint Commission of the United States and Canada, Indus Commission between India and Pakistan, as well as the Rhine Commission shows professionalism in water resources management. Many provisions, especially of the Columbia River Treaty of 1909 and the subsequent treaties would be appropriate for Central Asian region. The main difference of our commissions from these commissions lies in the fact that none of these commissions are practically directly involved in water allocation and monitoring of water allocation. All these commissions are engaged in management and control over management, i.e. control the observance of those principles, which the commission established.

A main noteworthy result in our region is that from the very beginning, certain principles of water allocation were retained. Analysis conducted by ICWC of adherence to these principles (Dukhovny V.A., Sorokin A.G.) throughout the period of ICWC activities shows that the water share fixed by agreements were strictly



maintained, with very little deviation and even in dry years all water users received, nationwide equal shares, which was specified by these agreements. Unfortunately, the countries themselves in these dry years, gave priority to their various zones.

The availability of the worked out system of principles and control over water allocation is a big advantage of ICWC, which does not have analogs in the world, as nobody in the world allocates water on a daily basis. Another positive point specified in the agreement is the equality of funding and the need to develop a strategy. Unfortunately, inobservance of both of these provisions, laid the foundation for all the current tensions that exist in our area.

The main problem is that all energy organizations, which operate reservoirs dictate their energy regime, which often causes damage and especially during dry years. Although provided that water allocation and operation mode is rational this could have been avoided. All participants perceived the presentations and reports with great interest and expressed their gratitude to the organizers of the seminar - SIC ICWC and TC ICWC, UNESCO-IHE, the sponsor of the seminar, as well as expressed their desire to organize similar events at national and other levels.

Both printed versions of reports and presentations, as well as electronic versions of all training materials for each block were distributed to all participants. It was decided that all future trainers who participated in this first regional seminar, based on more in-depth study of these materials will create in consultation with the heads of water management organizations, expert working groups at national-level to analyze the presented training modules and develop joint proposals for their finalization, improvement and final adoption at the second regional seminar in September-October 2010. After approval of the final versions of training modules, subsequently their confirmation will be carried out at individual seminars under project at national level.

Upon completion of the seminar, the participants assessed the training course by filling out questionnaires specially designed by TC. The purpose of this evaluation was to determine the effectiveness of programs and receive proposals for improving their quality, as well as identify the strengths and weaknesses of the program and take into account the feedbacks when conducting similar programs in the future.

According to the results of the evaluation, the participants were satisfied with the results of the seminar, in particular with the knowledge and organization of the training. In their responses, participants stressed that the course was useful for the preparation of analytical documents, work with databases, cooperation within the framework of interstate commissions of the Central Asian countries, conducting international negotiations to solve water problems and solving regional problems related to the shared use of water resources.

According to a small number of participants the Blocks «International Water Law and Policy» and «Improvement of Irrigated Agriculture», as well as topics related to the establishment of WUAs, councils and committees should be reduced.

Participants also expressed their opinions on the expansion of such topics as, «The experience and prospects of IWRM in Central Asian countries. Best practices and approaches of leading countries», «MIS», «Issues of basin water resources

management», as well as Blocks of «Regional Cooperation in Transboundary Rivers», «Integrated Water Resources Management».

The following topic was proposed for inclusion in the course program – «Reforms in water sector, positive and negative aspects».

The participants mentioned the competence and professional knowledge of lecturers, the efficiency of various interactive learning methods, including role-playing, logical sequence of learning materials, active debates and discussions and well-organized training course.

Suggestions made by participants on further improvement of the course:

- shortening the training course duration up to 3 days;
- holding a separate seminar for each block;
- paying special attention to practical exercises.

The participants agreed on the need to maintain the stability of training activity by joint efforts. This primarily requires permanent financial, institutional and political support from governments and donors. In particular, following proposals were made:

- strengthening of TC branches, attracting foreign specialists;
- translation of educational materials into national languages to organize the course at lower level;
- combination of the training courses with meetings of the Basin Councils, which are held twice a year. Basin councils have been functioning successfully in Almaty since 2006.

During the discussions, following obstacles and barriers to the sustainability of the training course in the region were mentioned, in particular:

- there is no professional development program in Turkmenistan;
- there is a problem with issuing of certificates in Turkmenistan, as it is not allowed without the government permission,
- the goal of national trainers to explain and convince the leadership of the usefulness of training courses;
- not all states will be able to fund training after the project completion.

Prof. Dukhovny V.A. summing up reminded that in Shariah (Islamic law) water is compared with the holy thing and it is our duty to inculcate this sense from early childhood. He stressed the importance of such events in order to unite the Central Asian region under a common idea - to survive together. Water should not be a wick

or a political lever, but rather an incentive for mutual understanding, trust and consolidation.

During the seminar the following recommendations were developed:

- reducing the duration of the training course to 5 days;
- duration of the lecture should be no more than 1 academic hour (45 minutes);
- application of various learning methods, primarily interactive;
- searching the regulatory mechanism which would allow specialists to take appropriate professional development;
- teaching professionals how to use the regional information system on water and land resources in the Aral Sea basin (CAREWIB), which is an important tool to strengthen regional cooperation;
- engagement of the public and the state in water resources management and maintenance of water infrastructure;
- organization of training activity at the WUA level taking into account the vegetation and non-vegetation period.

At the end of the seminar, a solemn presentation of certificates to participants of the seminar took place.

## **Water productivity improvement at the field level**

On June 17-18, 2010, a seminar-meeting on the subject “Strategy of project tasks performance and exchange of experience” was held in Tashkent within the “Water Productivity Initiative - Pilot Level” Project (WPI-PL).

Professor V.A. Dukhovny opened the meeting by a report about long-term goals and objectives of the project. He stressed that with broad world experience and developed extension services in the world, that system in Central Asia was not organized and the organizational forms of those services were not represented at the national level. Hidelands in Kazakhstan have increased up to 25 ha, and in Uzbekistan – up to 50-70 ha. Under these conditions, consultation system and involvement of skilled specialists acquire great importance in the increase of farms productivity and profitability. Fine-tuning of the organizational forms is a milestone in the implementation of the project, and its result will be evident by the work of each partner organization involved in the project work. There are proposals related to the development of extension services (ES) on the WUA base. We have to work through and check these proposals, and give an opinion concerning their

appropriateness. Very important part in the work of extension services is information basis. Only reliable and constantly updated information enables making correct decisions. Another matter of grave importance of this project is assessment of the financial sustainability of farms. The last years' results for two projects IWRM-FV and WPI-PL give cause for stating that the farm financial sustainability is an objective of priority of the project. In our works, we should clearly represent the financial condition of farmers in the reports of the trainers. Analysis and assessment of resources use effectiveness is carried out on the basis of financial indicators. Establishment of farmer schools is also of great importance in the project implementation. Farmer schools, like extension services, should be organized in places convenient for farmers. It is offered to establish those under WUAs; however, there is another experience – establishing on the basis of the demonstration sites of extension services. The project experience is very essential for other projects. For example, a series of meetings and workshops on experience exchange were conducted, and materials and user's manuals were distributed within the IWRM and RESP projects in 2009.

Mr. Sh. Mukhamedjanov reported on the advisory works strategy. In particular, he noted that the main consultancy principles are as follows: assistance of farmers in solving their problems; development of farmer's knowledge in agricultural production; rise of farmer's income; helping farmers in gaining higher income at lower expenditures. The consultations must not be intrusive; the consultants themselves should go to the farmer and do not wait until the farmer expresses willingness to come to an extension service; consultants must not disregard the farmer no matter what issue he raises. The experience of 2009 has shown that extension services should be established where farmers often come to solve their everyday problems. Today, farmers commonly come to the WUA that works properly. It is logical to establish extension services and farmer schools under WUAs. It is very important that not only a hydraulic engineer but also an agronomist should be available in the WUA. It is necessary to rest upon former kolkhozes management system, where all agricultural production processes would be managed, chiefly, by an agronomist and a hydraulic engineer. In the WUA, which has the same area as the former kolkhoz does, the agronomist and the hydraulic engineer will mostly advise on optimum and efficient execution of the agricultural production instead of managing.

Messrs. M. Reddy Junna and J. Kazbekov spoke about the vision of the information centers operation strategy within the project. In particular, main tasks of the Information Center were highlighted as follows:

- processing and translation of knowledge into a language comprehensible for farmers (at that, maintain good communication with research institutes and be based on the results of their researches);
- development of training and methodological materials for extension services (depending on the selected distribution strategy of an extension service and needs and demands of farmers and extension services);

- training of trainers and consultants-disseminators in the conduction of advisory work (which methods should be applied); feedback: continuous assessment of the materials quality and digestibility and improvement of those proceeding from the opinions of relevant research institutes, extension services, and farmers.

At that, information centers must know scientific questions as well as understand farmers' problems and know the consultation work. It was proposed to develop a package of documents, including technologies, for each country, which contains the following types of materials (at coordination with information centers and with the assistance of relevant research institutes and extension services):

- Original source – a book containing the rudiments of effective water use at the field level, beginning from the irrigation basics, soil conditions, climatic issues, moisture, organization of irrigation, crop demands, irrigation regimes, etc., that is to say that this book should include all issues related to the carrying out of irrigation. Trainers-consultants can use this book during their consultations. As the basis of this book, i.e. its contents, the form of the “technological map” developed by the regional group can be used.
- List of technologies: package, catalogue, and list of all technologies. The catalogue of all technologies/innovations (list) on water saving and effective water use at the field level taking into account the needs and demands. The catalogue should indicate what problems are being solved, essence of technologies (advantages and disadvantages), problems faced at their implementation and the ways to solve those, costs associated with the implementation, economic benefits in the result of the implementation, whom one should turn to when questions arise.
- One should develop workbooks on carrying out of consultation works on every technology. In other words, training modules and training conduction methodology should be developed for the consultation works. This package should include the system of assessment, feedback, and tracking of proposed and adopted technologies, which, in the last analysis, will indicate the work effectiveness.

Ms. L. Averina delivered a report about the collection and assessment of the original sources on demonstration fields and farms. Particularly, she noted that the purpose consisted in assessment of the effectiveness of the water use productivity improvement project and identification of areas for further works. All partners were criticized for the execution of forms and were given recommendations on further actions. Besides, she focused the partners' attention on the fact that the farms monitoring was carried out with the view of detection and tracking of problems and shortcomings in the agricultural production of farms in order to develop recommendations and further rendering of consultations.

Messrs. S. Isamutdinov and A. Khoshimov spoke of the approach in the consultation works with farmers and interaction of partners in Tajikistan. They noted that one agronomist and one hydraulic engineer worked in every district; they together made field visits. Trainers visit farmers and provide individual consultations 2-3 times a month. They record existing problems in their logs, give their recommendations and observe their implementation. The trainers conduct trainings in the information centers 1-2 times a month.

The Tajikgiprovodkhoz (Tajikistan State Design Institute of Water Management) has prepared a questionnaire form. Three types of consultations are provided:

1. Individual consultations: based on the experience and the results of trainings held.
2. Group consultations: 1-2 times a month by conducting workshops.
3. Mass consultations: by means of mass media, newspapers, and articles.

Mr. M. Mirzaliev told about the activity of the Information Center and its cooperation with disseminators and relevant research institutes in the Fergana province. He mentioned that the Fergana province was divided into three zones (old irrigated, new irrigated, and adyr lands) and asked research institutes for their assistance in the preparation of recommendations allowing for the peculiarities of the zones.

The remarks of the Tajikistan team, represented by Mr. A. Khashimov («Zarzamin» Ltd.) are as follows: farmer field schools must be independent; they should be established in the place mostly visited by farmers. The farmer field schools must have required equipment: hydrometers, precipitation gages, soil moisture meters, etc.

In her speech, Ms. D. Islomova («SOF» Ltd.) emphasized that they cooperated with relevant research institutes, when they together develop information materials and organize joint field monitoring visits. Farmers jointly with trainers from extension services carry out monitoring and evaluation of fields. The extension services give source information materials and assist in the provision of feedback with the farmers. The Data Base has been developed for joint evaluation of needs and demands. To ensure efficient work, they consult with disseminators by the telephone and e-mail, organize control visits to fields, and hold regular working meetings (twice a month) with the purpose to discuss the questions arisen. Based on the discussions conducted and analysis of source information, they conduct training for trainers and prepare adapted training materials for farmers. A visual and very simple statistical database has been prepared for and presented to disseminators.

The Regional Manager Sh.Sh. Mukhamedjanov recommended to disseminate that analysis and assessment approach among other partners in Uzbekistan and Kyrgyzstan. The Provincial Coordinator Kh. Khadjiev was charged with preparation of appropriate material for sharing experience by means of the regional group. Mr. Sh.Sh. Mukhamedjanov noted that the Tajikistan team, guided by the Provincial Coordinator Kh. Khadjiev, has solved the problem related to the assessment of

satisfaction of farms with consultations and technologies provided. Taking into account the successful work of the “SOF” Information Center in the analysis of the source material, it is necessary to strengthen the “SOF” Information Center specialization in hydrotechnical issues in order to ensure even more effective work.

Mr. Sh.Sh. Mukhamedjanov mentioned also that the project website was created at present and information base was supposed to be included in it for not only review but also for online working.

Next morning (on June 18), the first report was delivered by the Head of the Information Center of the Andijan province Mr. A. Kamalitdinov.

He informed those present of the approaches employed by the Information Center in its work. In particular, it was proposed to establish the farmer’s corner under agro-industrial complex, make use of local social and organizational conditions. Khokimiats shall establish groups for the identification and evaluation of farms fields; these groups can be employed for getting information from farms uncovered by the project and developing a package of measures for both preparation of recommendations and training of the specialists from khokimiat groups. The Information Center (IS) always tries to rest upon the actual situation and initial data. On the basis of problems analyzed, they identified questions from farms which were conveyed to the Central Asian Research Institute of Irrigation (SANIIRI).

Then representatives of research institutes took the floor.

First the representative of the Sogd Branch of “Tajikgiprovodkhoz” spoke.

Particularly, he noted that the principle of the institute work within that project was search for materials for working out of recommendations and approaches, as well as determination of indicators for information centers and disseminators. They rely on the materials of past years, established standards developed for land reclamation (irrigation standards); use data of hydrogeological expeditions; participate in IC/ES workshops; receive on-line information from farmers; together with IC, they prepare bulletins of agrotechnical measures in advance every month; at coordination with the provincial leader of the project, they conduct coordination meetings with all partners on a monthly basis; and working meetings are weekly held in informal way.

Speech of Mr. V. Nasonov, SANIIRI.

The project related work proceeds from the following points: development of recommendations taking into account farmers’ needs; search for research materials. In cooperation with information centers, they convert research results to easy-to-use and comprehensible material. To date, at the request of the Information Center of the Andijan province, they have completed and passed the Recommendations on the irrigation regimes for cotton plants cultivated under film on soils with different texture to the Information Center. Irrigation technologies that fit the current sizes of farms have been identified and are now ready for distribution. Other recommendations are under development. The Information Center’s remark that the recommendations should be discussed with disseminators and trainers, and specialists have to be trained in the conditions of practical application is fair enough. Coordinated actions between the Information Center, disseminators,

trainers, and research institutes will substantially depend on the problems the farms are faced with.

Khalim Khodjiev. Tajikistan.

Economic circumstances.

In the result of the monitoring carried out, the physical and financial expenditures of farms in the period from tillage to harvesting and selling of the grown crop were determined and analyzed for each demonstration site in 2009. Subject to the scope of agricultural works and their costs, they calculated costs of all agrotechnical operations in the national currency. The same work was performed in 2010 as well. As of June 1, two cultivation and one hoeing (crust breaking) works were carried out additionally in the farm “Buri Kurmas” as compared to year 2009. Hired labor force cost has risen from 10 to 15 Somon (Tajikistan currency), i.e. by 50 %; fuels & lubricants and mineral fertilizers prices have risen by 30 and 12 %, respectively. Ten percent of the crops have been damaged; cotton growth and development lag comes to 8-10 days. In the dekhkan farm “Shark”, the state of the crops is good; the sprouts were obtained without preliminary irrigation. One hoeing (crust breaking) was performed additionally. Cotton growth lead as compared to year 2009 came to 6-8 days as of June 1. Rise in fuels & lubricants, mineral fertilizers prices as well as labor force cost was 30, 12, and 50 %, respectively.

The Mr. S.A. Nerozin’s report was about the agro-economic analysis of water and land use productivity and effectiveness. Variable costs mean the costs that are directly related to the growth of a specific crop in the field. They include the costs of seeds, fertilizers, pesticides, machinery, labor, irrigation water, transport, and other expenditures. Variable costs are calculated as the product of the production factor price and expenditures expressed in physical terms. Fixed costs are those which virtually cannot be attributed to the growth of a specific crop: the costs of electric power; general transport and equipment that are not used in the field; leasing, e.g. lease of lands, storehouses, etc.; taxes on land, transport, licences, insurance, etc.

He presented the forms of fixed and variable costs monitoring and emphasized the importance of correct completion of the forms for correct analysis and, as a result, taking a right decision.

The workshop participants put forward the following proposals:

- Information exchange. Always send all materials to the partners in all the republics. Everyone is interested to know what materials are issued, how to fight against pests, what workshops and training are organized, how climate influences on the works being implemented, etc. (S.A. Isamutdinov).
- It is necessary to make calculations of the most economically effective agricultural production; carry out predictive economic analysis, viz. determine effective approaches to raising the farm income by calculations. Proceeding from that, using these calculations as an argument, as an economic lever, the farmer should be given advices on agricultural production (Sh.Sh. Mukhamedjanov).



- Irrigators' schools as well as farmer schools should be established. Today, there is lack of good irrigators. In every republic, in every district, good irrigators can be found; they can be involved as trainers to farmer schools. (J.S. Kazbekov).
- Taking into account the interest of other projects in our experience, two model farmer field schools should be established on the basis of base WUAs (M. Mirzaliev).
- Making special mention of the successful conduction of this workshop, its usefulness and significance of experience exchange, as well as activity of partners, it is proposed to organize the next workshop in August of the current year; conduct it in more interactive way; work in groups, using flip charts, and form groups depending on the partners' specifics (Sh.Sh. Mukhamedjanov).
- At the next workshop, organize an exhibition of handouts (bulletins, brochures, etc.): who issues what, what bulletins, advices, newspapers, and so on. (J.S. Kazbekov).

## **Hydropower in Light of Future Challenges (HYDRO 2010)**

**Lisbon, Portugal, 26-29 September 2010**

Yearly conferences "Hydro & Dams" usually gather a lot of participants. Recent conference in Lisbon was not exceptional - it gathered to exhibition and 24 sessions more than 200 persons under slogan "Meeting demands for a changing world".

The key report of Jone Brisko, former chief specialist on water resources in the World Bank, was alert - the international financial institutes returned to financing large waterworks as sources for solution of the sustainable development problems. Energy and Water - two very needed vital compositions. But what they look like?

Today more than 75% of world commercial energy is being produced at the heat stations (coal, gas, oil, nuclear fuel). This kind of fuel is supposed to be enough no more than for 200-300 years. At the same time the energy production per capita increases though sharply different: European countries and Japan - from 5000 to 10000 kilowatt/hours, USA - 14000 kilowatt/hours, Norway - 26000 kilowatt/hours, China - 1800 kilowatt/hours, India - 700 kilowatt/hours. It is naturally that India with its growth rate will aim to overtake China and then also the developed countries. The global hydro-energy resources are 2800000 megawatt. Recently the defined power capacity is 900000 megawatt or 32% (Sharma Hari, 4.02). (the indicated number in brackets is a reference number to the report's index at the conference, here and after)

Reporter openly denounced the nearly 25 years' policy of the Bank (from 1980 to 2003), when under the influence of a "very green movement" as a struggle against the Sardar Sarvak dams in India, as well as the Report of the Commission on Large Dams, investments into water infrastructure have fallen to 2000 in 2,5 times, into irrigated agriculture - from 20% in 1975 to 3% in 2000. The opposition of countries which are "self-sufficient in energy and food" to the needs "of hungry and destitute countries" had been overcome only gradually under the influence of pressure of transition countries (China, Brazil, India), who develop this infrastructure independently. It was competition that turned "the World Bank's camel" to finance these objects. But it is not correct to say that the return to old way has been occurred. The priority in the hydropower development was given to developing measures on risk decreasing and systemic operation of the hydropower complexes.

Today a great attention is given to development of strategy on operation, policy and procedures in the hydropower sector.

EDP -"Energy of Portugal"- has developed a special guidance on preparation of such strategy. It includes:

- gathering, processing, analysing in detail of current operational characteristics in real-time mode;
- assessment of flexibility and multi-purpose capabilities of operational teams supported with effective and elaborated instruction on maintenance of objects;
- development and enhancement of vibration monitoring and analytical system to assess the infrastructure elements.

The main indicators that have been analyzed for 15 years (Paulo Costas Silva) (20.01):

- Total opportunity;
- planned interruptions in development;
- unforeseen outages.

A somewhat different approach in that direction was provided on the basis of experience of the German network of hydropower (BEW). The task was to standardize the operational strategy of two hydroelectric power stations, one of which was reconstructed, and the second one - was to be reconstructed. The purpose of the strategy was to identify in what areas the changing of the modern management system to improve efficiency and reduce potential risks is needed. The following has been analyzed:

- a detailed procedure to detect abnormalities in normal operation;
- the involvement of responsible experts into elaboration of recommendations;

- system analysis and standardization of procedures for HES's comparable sites;
- development of numerical performance indicators to make more transparent all the costs.

The above costs were reduced by 28% and the risk is reduced by 18% on average. The procedure was developed by Dr. Kalaitris Partner GmbH (20.04).

Norwegian experts (DHV) have analyzed the security risks of hydroelectric power plants operation in Western Europe and in Asia. It was defined that the fatal risk in Europe is 10-20 times less than the same in Asia. It was suggested a technique which can significantly reduce the risk in hydropower performance in developing countries (20.05). Overview of dynamic parameters and factors of instability and their influence on the state of hydraulic machines is implemented by the Swiss and Canadian professionals (20.07). Unintended the flow pulsing level, hydraulic shock, vibration flows during the operation of turbines, generators and pumps, affect all kinds of equipment, cameras and even buildings. The current operation imposes greater demands to changing the modes, reinforcing unusual phenomenon. Generalization of the most important cases and regularities on the basis of past and current researches is presented in the form of recommendations published in cooperation with the Canadian "Electrical Association" (CEATI International) and "Andritz Hydro", Switzerland. Various emerging hydraulic phenomena of instability, causing vibration, is structured in a practical manner with assessment of their impact, frequency of occurrence, troubleshooting. The measures are also given to reduce the risk of such phenomena in the HPS performance. The limits of international standards are specified. 22.05 - SH management and role (a review by the University of Cambridge).

Portuguese Hydropower Production (EDP) (22.06) didn't develop a big plans since 1992, having concentrated attention on increasing their efficiency and consideration of risk. However, in 2010 the Government decided to resume construction of hydropower stations and the construction of reservoirs to reduce the impact of climate change and the need of the long-term flow regulation strengthening. However, the inability to work in this area by the old methods has led to significant changes of approaches, design and construction of such structures. The main attention is focused on sustainable development, communication systems, information and involvement of local stakeholders, as well as a wide range of local official agencies, environmentalists, etc.

Evaluation of all surrounding area, which will be affected such new construction, is accompanied by prediction of income changes and assessment of damages for various participants. The full involvement of all local stakeholders, their information, their views and suggestions can help conflict-free start-up into operation, especially if compensatory measures are sufficiently designed and implemented. The involvement of specialists, economists and social mobilizers is essential element of such development.

Similar work is being implemented by Norwegian companies at their country and in Vietnam (22/07). The relationship between community leaders and the affected persons, land ownership, access to resources in the past and in the future, social inequality and the possibility of its reduction (or increase), possible assistance to the most poor population, economic opportunities, etc. is taken into consideration.

Increasing of problems in the hydropower and reservoirs' nodes operation is connected with reservoir's sedimentation. Implementation of observing sediments, their dislocation, their sources is very important to estimate the life-time of reservoirs (24.01). IHE-UNESCO Institute (P. Boerliu, D. Roelviuk) has developed mathematical models of sedimentation process in large reservoirs (24.02). The methods of combat sedimentation were shown:

- France's experience at the dam Rizanesse in Corsica on application of the transit gate (24.04);
- special regimes of releases from reservoirs Murrow in Sudan for discharge of sediment downstream through the spillway (24.05);
- applying hydrocyclones for sediment discharge in Australia (24.06);
- washing tanks by using the largest settling ponds;
- experience of Nasna Dzhakri Project (7.24) and the Baspa project Phase II HE (24.09).

The report on investigation and measures on removal of the effects of the Sayan-Shushenskaya disaster of Dr. Berlinder, Director of the Institute VNIIG, has attracted exceptionally high interest. Commission of Accident Inquiry, having considered four reasons, has concluded that the accident occurred as a result of 6 screws disruption securing the 2-th hydrostructure that caused the explosion of the generator and turbine, flooding of engine room during 30 seconds, stopping electricity generation. All 75 people who were in the engine room died. Normal wear of all the bolts on the damaged turbines was 64.9%. Construction part is not affected. Discharge passed through the dam at the maximum of 9,400 m<sup>3</sup> / s, reached 2350 m<sup>3</sup>/sec.

Currently 4 units have been repaired and are partially put into operation. 3 units are being repaired and 3 units will be produced. It is noteworthy that this is one of the highest dam in the world which in difficult climatic and hydraulic conditions has sustained emergency very well. Nevertheless, the lessons from this tragic history has to be learned:

1. The permanent control of operational status of all units, machinery, devices must be obligatory in such large water systems, as well as the creation of conditions of life-support equipment during the switch-off time (or during the accident on the power system). Power backup of such waterworks, regardless of the initial state, is necessary. Especially it is important for crane equipment when independent diesel units should be provided in the event of liquidation of all lines. Backup is generally a condition for the safety of such structures.

2. Verification of equipment's state should be done by operators together with equipment manufacturers at least 1 times a year.
3. All the "Rules of operation of large hydropower on rivers", including the "Rules of operation of large pumping stations" should be revised with consideration of analysis of the accident.
4. In a complex set of interactions between water management and owners of hydroelectric power stations and the systemic controlling energy flows and supply, the priority should be given to the water authorities who have to check the reliability of operation of all facilities and personnel readiness for emergencies on a quarterly basis. It is they who must approve the "Rules of operation of large water systems" and accurately monitor their implementation. Current incorrect commands of system operators out of line with those rules, should not be performed. From this point of view, the experience of Uzbekistan, which organized the special "State Committee of Supervision for large structures" under the Cabinet of Ministers of Uzbekistan is very good experience.

The Sayan-Shushenskaya HES's disaster must be the alarming case because the energy specialists can not be trusted to manage water. Water must be managed by water authorities and powermen has to use the water that can be allocated for them according to the river regime.

In general, noting the strong interest to the hydropower problems, the absolute underestimation of current situation, when hydropower is trying to dictate all their demands both on release regimes and economic approaches to all consumers should be emphasized. I raised this issue on the section "Multi-purpose use of water resources", led by Mr. Daryal Fields, a leading expert from the World Bank. Having been invited there as an expert, I noted that all reports were related to issues of national resources use, in which hydropower prevailed (the Chinese experience, the experience of Chile, a key paper of A. Biswas). Nevertheless, the integrated use of transboundary rivers has not yet a positive examples except the USA-Canada and India-Pakistan. Moreover, tensions are being pressurized more and more in water scarcity zones, where hydropower is trying to put their demands of upper watersheds as priorities.

Specific interest are presented the exploitation of off-channel reservoirs with units of bilateral operation (turbine-pump). In Portugal and Spain large complexes with capacity of 325-400 megawatts and low pressure (70 m) are built. These are Girabaltas and Alamera (800 m) in Portugal, and Mirales 2 (Voith Hydro) - in Spain. The use of "a wall in the ground" method is increasingly implemented in construction and repairing of dams. In 2006-2007 this method was used for repair of earthen core of Inguri hydroelectric power station in Georgia. Similarly, in Sri Lanka to eliminate leakage through the bottom and side filtering through the karst on the Samanolaveva dam which height is 105 m "a wall in the ground" with depth of 100 m and 1300 m in length was built. 13.400 tons of cement and 50,000 m<sup>3</sup> of clay were used. Similarly, the concrete "a wall in the ground" has been used in

Australia at the Hinze dam to reduce water losses, after a soil "wall" had not worked.

## **Work meeting of the Expert Group on Improving the Structure and Legal Basis of IFAS**

**Almaty, Kazakhstan, October 23, 2010**

An Expert Group was formed by the order of the Chairman of EC IFAS on 16<sup>th</sup> August 2010 to prepare proposals for changes and amendments to the statutes of IFAS.

The main task of the Expert group is to assist in the implementation of the Joint Statement of the Heads of States IFAS, on *"... improving the institutional and legal framework of IFAS with the aim to increase its efficiency and greater interaction with financial institutions and donors to implement projects and programs coping with the Aral Sea Basin..."*.

Accordingly, the meeting was attended by delegations consisting of representatives of the Executive Committee of IFAS, the national experts and representatives from the IFAS member-states, as well as experts from the regional organizations IFAS, and the international expert on water law (S.Vinogradov). The meeting was also attended by the UNECE regional advisors (Bo Libert and Marton Krashnai) and the representative of GTZ.

By the moment the completed work includes an analysis of this situation carried out by national and international experts (set out in the discussion paper dated January 31, 2010). This workshop was aimed to clarify positions and to reach consensus between the countries on improving the structure and statutes of IFAS.

The meeting participants presented position of the countries and expressed their views on possible options to improve the cooperation mechanism at the regional level. At present, it presents suitable to the evolutionary path of development ("soft" option). This means no radical changes in current structures and only make corrections and amendments to the regulations in order to improve effectiveness of regional cooperation.

In the final session, members of the Expert group discussed the work plan on improving the structure and statutes of IFAS in 2010 to 2011. The next work phase includes preparation of conceptual proposals, including clear articulation of approaches to implementation by the Expert group (by February 2011, when the next meeting of the Expert Group is to be held).

Proposals to the draft ASBP-3 were not discussed during this meeting.

## **International Scientific Symposium «Water in Central Asia»**

An International Scientific Symposium “Water in Central Asia” was held with the support of the German Federal Foreign Office in November 24-26, 2010 in the city of Tashkent. The co-organizers of this event was the CAWa project, SIC ICWC, and the German Research Center for Geosciences GFZ.

Central Asia faces big water-related challenges, among them water scarcity, degrading water quality and inefficient water use.

The impact of climate change on the region’s water resources, although studied by a number of Central Asian and international researchers at various scales, is not yet known in detail. The results obtained from different scientific approaches like trend analyses, climate models and hydrological models have to be compared and validated to give an overall picture of the region’s future water budget. Various scenarios have to be considered.

In present days, water managers are coping with significant data gaps hampering water management decisions. Not all processes influencing the water balance are yet quantified – such as the interaction of ground and surface water. Today, space-based information on land cover and water-related parameters offers great opportunities to bridge those gaps. Their incorporation into integrated water management models is expected to significantly improve water management.

The project “Central Asian Water” (CAWa) is part of the Central Asia Water Initiative (also known as the Berlin Process), which was launched by the German Federal Foreign Office on 1 April 2008 at the “Water Unites” conference in Berlin. It intends to contribute to a sound scientific and a reliable regional data basis for the development of sustainable water management strategies in Central Asia

The participants included researchers from Central Asian and international institutions, specialists from hydrometeorological services, water managers, representatives from development agencies.

The opening ceremony was held by the Director of SIC ICWC Prof. V.Dukhovny, His Excellency Ambassador of Germany in Uzbekistan W. Neuen, the CAWa Coordinator Prof. B. Merz, and V.Akhmadjonov.

Bruno Merz has presented CAWa activities to the participants. He noted that the CAWa project intended to contribute to a sound scientific and a reliable regional data basis for the development of sustainable water management strategies in Central Asia.

Vakhid Akhmadjonov in this report underlined the importance of holding such events, strengthening international and regional water cooperation, and adopting IWRM principles in the region and emphasized a water conservation issue.

The international symposium focuses on applied research against the background of Central Asian water management trying to bridge the gap between scientists and water managers. The symposium aims to:

- present and discuss the preliminary results of the CAWa project,
- review current research achievements in Central Asia,
- discuss new scientific methods to approach Central Asian water issues,
- debate regional research priorities,
- promote regional cooperation among scientific institutions from Central Asia and the EU,
- provide a platform for the strengthening of international networking through sharing and mutual learning.

More than 100 scientists from Central Asian countries, Afghanistan, Germany, Switzerland and Russia took part in the Symposium.

The program consisted of:

- four individual sessions, and
- a poster session.

The Symposium focused on the following themes in four sessions:

### **Water availability in CentralAsia: Past, present, future**

The session was co-chaired by Dr. Sergeiy Vorogushyn and Dr. Natalya Agaltseva.

Global change will affect the amount, temporal distribution and quality of naturally available water resources in Central Asia - with consequences for water management. This session focused on the assessment of the dynamics of change using climate and hydrological models, trend analyses and scenario development.

H.G. Kunstmann, M.Mueller, D.Duethmann, A.Sorokin, B.Libert, A.Lineitseva, A.Manditchev, M.Ikramova and others made their respective presentations.

### **Water management in agriculture:Processes, modeling and implementation**

The keynote speaker and chair of the session was Victor Dukhovny. The presentations were given by O.Anarbekov, U.Djanibekov, I.Dernedde, A.Akramkhanov, G.Stulina, H.Oberhaensli, M.Khorst, N.Mirzaev, A.Karimov, M.Bekchanov, I.Bobojonov, K.Jumaboev, N.Djanibekov, and Yu.Kamalov.

Water managers in Central Asia are facing large challenges, such as optimal water allocation, increased irrigation efficiencies, selection of appropriate crops, soil



salinisation. Yet, not all processes influencing these tasks are fully understood and quantified. This session covered processes affecting agricultural performance such as interactions between surface and groundwater, as well as monitoring methods, integrated models for water managers and approaches to increase water productivity.

### **Remote sensing and information systems for sustainable water and land management**

The keynote speaker was C.Conrad. Kamilya Kelgenbaeva chaired the session. The presentations were given by U.Gessner, D.Klein, A.Gafurov, J-F.Cretaux, M.Idiev, C.Zech and others.

Remote sensing offers great opportunities for natural resource managers, scientists, and policy makers. Crucial information on the land surface can be derived at different spatial scales and for repetitive time steps, e.g. on land use, land cover, snow, soil moisture changes. Such earth observation and other information can be tailored to the needs of users and visualized in information systems. This session was dedicated to remote sensing applications and information systems and their potential for supporting sustainable water and land management.

### **The dynamics of the cryosphere and its role in the Central Asian water cycle**

The session was chaired by Wilfried Hagg. Reports were made by M.Hoelzle, A.Yakovlev, A.Finaev, D.Kriegel, C.Mayer, M.Petrov, V.Konovalov, A.Zubovich and others.

The cryosphere accumulates significant amounts of water in the Central Asian high mountains and is thus a key source of water supply. Yet, it is particularly fast responding to increasing temperatures and changed precipitation patterns. This session was dedicated to glacier and snow cover dynamics in Central Asia, monitoring methods and the quantification of the cryosphere's role in Central Asian water balances.

The speakers presented data on Central Asian glaciers and monitoring data by LANDSAT, TERRA-ASTER, SPOT, IRS-LISS and other space facilities. By using the hydrological model WASA, researchers even reconstructed the glacier mass balance and filled the data gap from 1993 to 2005. The EC IFAS member from Tajikistan Mr.M.Kazakov gave his proposals on glacier studies. Particularly those referred to the establishment of a fund for glacier research and conservation, including capacities for glacier observation in Kyrgyzstna and Tajikistan, glaciological expeditions, the provision of weather stations with equipment for monitoring of climate and snow-ice cover, the development of an information system, GIS and database on glaciers and hydrometeorological conditions by using RS and field observations.

Each presentation was followed by lively discussions.

The Symposium was very fruitful and the participants shared very actively their experiences and information. It is important to note that scientists from Afghanistan took part in the Symposium as well.



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