

THE WATER IS A CENTRAL PROBLEM OF CENTRAL ASIA

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Introduction. Central Asia (CA) is one of the largest locked eco-systems of the planet which has no access to seas [picture 1]. A number of the region rivers totally distributed for agriculture: Ak-Buura, Amu-Darja, Jakhsy, Isfana, Isfara, Varzob, Karatag , Shirkent, Syr-Darja, etc. Artificially irrigated lands: 1,1 mln hectares in Kyrgyzstan, 2,8 mln hectares in Kazakhstan, 4,2 mln hectares in Uzbekistan. There is high demographic growth, in spite of civil war, and emigration latest 8 years. Steadfast shortage of land per capita (coinciding with “Limits of Growth” concept): Kyrgyzstani irrigated land per capita in 1975 – 0,27, but in 2000 – 0,18; Todjikistani in 1975 - 0,17, but in 2000 - 0,13. The ecological results of extensive economic activity in communist era and permanent demographic trends were: Aral Sea drying up, ground waters high up (lead to hundreds building sinking), pesticides pollution, human health damage (immunity fall, revitalizing of water-depending diseases). The social results are: a) tension between states (Tojikiston-Kyrgyzstan, Kyrgyzstan-Uzbekistan) for water-using; this tension realized by local-conflicts between customers (bloody or frontier posts destroying in 1989, 2001, 2003, 2004); b) rise of poverty and emigration from environmentally unfortunate areas.

Water and health are very closed to each other. There were a high level of malaria in CA in 30th, 40th years of last century (till 25% of population each year [ref.1]). DDT using and bogs dry campaign at the 40-th, 50th lead to the disease disappearance in 70th – 80th. But it appear again in CA states at the end of 90th. Several cases of cholera were found in last years in Kazakhstan, and vibrio existed in several water reservoirs in Kyrgyzstan and Uzbekistan. Specialists are expecting outbreaks of malaria and cholera (and steadfast of helmintosus) in nearest years by Global and local Warming. Soil humidisation are leads to suitable condition for pathological biocenosis of these diseases (in Fergana valley, and in the Lower of Syr-Darja and Amy-Darja - especially). Helmintosus had been spread in CA, but most severe (dracunculosis or “rishta” and others) had been overcome in 40th, 50th. But they steadfast last tenth (askaridos, heminolepidosis and abdominal typhus). Most part of cases (over 90%) are not registrated by official statistic by low population sanitary culture and lack of laboratory equipment. There are wide spreading of ban or obsolete pesticides (secondary generation: aphugan, diphosphalophos, di-, three-chlorphenoxiacetous acids, etc). They keep activity till half year, and are dangerous for human immunity and children health [ref. 2; 3].

Land deterioration. It has been spreading steadfast of irrigated land deterioration last 14 years in all CA. It cased by: 1) deterioration of drainage and water-sharing systems by management disturbance during Transitional Shock; 2) begin of regular warming ten year period (2002, 2004) in CA; 3) unfortunately irrigating regime by contradiction between necessity of energy (electric-hydro-station) and irrigated regions (this lead to risky water overflow from reservoirs to plane irrigation-net in unfortunate periods especially in 2000, 2002, 2004); 4) secondary of results (high up ground water level, salting of soil, bio-

degradation of soil by obsolete pesticides). A square, where ground water is high up to the surface - 25% in Amu-Darya river basin, and 66% in in Syr-Darja river basin. Most worst situation in mentioned field: in Akhalsky and Dashoguzsky regions (“velojats”) of Turkmenistan; in Navoji, Djizak, Syrdarja regions (“oblasts”) of Uzbekistan; in South Kazakhstani basin of Syr-Darja. Salting of soil has been spreading even in Alpine region (over 9.000 hectares in flood-lands of Naryn oblast in Internal Tien-Shen), although close to snow-ice massive, containing purest water. Total middle and high salting land square in the Central Asian region are estimated as 2.540.000 hectares. Effective coefficient of drainage fall one third during latest 14 years, and if the tendency prolonging till 2050 – half of the systems will be out of work at all. Disaster result of mentioned processes: 187 villages of Kyrgyzstan was in danger by landslides in winter 2003/2004.

Communities problems and activity. Communities problems are complicated by Transition Shock (in all five CA countries), and by Shock of Favour Tariff Abolition in last three year (in three countries). Additionally, by tradition mentality: community property of water in villages level, and strong governmental property (and regulation); and habit of customers (traditional “haus” [pit filled with water in home-yard], this water is used for cooking, washing, and bath). Regional communities try to overcome water-deficit/sharing problems by: 1) creating independent new associations of water-users; 2) implementing new mentality, habits and skills; 3) restoration of old irrigation/drenage system base on thrifty technology. Communities were organising water-user associations (WAU) - over 300 after privatisation process (began in Kyrgyzstan 1994), and based on Law on Rural Users Water in Kyrgyzstan (2000). Additionally, Drinking Water Users (over 60 in Kyrgyzstan) are forming last year. The example of successful decision is agreement of two communities living on both sides of state boarder in semi-desert area. Charvak - Kyrgyzstani village, the other – Khusher (Uzbekistani); total rural population both of them 7,5 thousands. The communities has installed common water-pump without support of governmental officials. This case was named “Water – Is the Source of Peaceful Life” in regional Mass Media in 2003. Traditional mentality and rules of lifestyle with perceptions of Nature as God Gift, it contradicting with contemporary principle “private property” on water. Our University and NGO are trying use eco-positive Moslem dogmas in eco-propaganda to get community support for water-reform policy, and for new skills.

Thrifty technology. Our NGOs with international funds supporting offering: a) restore of traditional water-consuming communities control delicate spreading of water for each village and families by high skilled “mirabs” (same in all South Asian Moslem areal); b) equipment for monitoring and rational spreading of flow volume in micro-canal net (“arik”) [ref.4;5]; c) pesticides monitoring, includes awareness of customers. It has been creating the original water-counters (five times cheaper compare with Western firms production). They has been installing in Fergana valley (Kyrgyzstani Aravan region, and Uzbekistani Fergana oblast). New equipment (32 devices) are monitoring 4600 irrigated hectares, but at the end of the year – till 68 000 hectares (accounters number should be 150-170). Additionally, FAO schedules monitoring and assessment in agriculture needs on correction by regional peculiarities of evaporation [ref. 6] and other losses. It has been implementing “automatic water flow monitoring system” [picture 2] based on hard ware and soft ware, cover total circle (account of sharing among users, deposit situation, display of the easy data). Key element of the system are original counters, which working automatically, and registries every hour median amount of water volume pass throw each canal. These data incorporated into date base of “chain

members”: sharing (local officers) – mediators (WUA) – terminal consumers (farmers). The accountants/sensors has been demonstrated in photo [pictures 3; 4]. The new system had been tested latest two years in regions of two states (Kyrgyzstan and Uzbekistan [pictures 5].), and compared with the traditional accounting order: visual assessment in canal’s branch points. New methods may thrifts over 50% water, which not was account by traditional method. It is very important in new water-service market background in the region.

Conclusion. There are a lot of unfortunate effects of: climate-demography, Transition Shock, habits, etc - in water-depending regional communities of the region. So, it is impossible to remove the problems completely. But we must do effort for alleviate even some of ones.

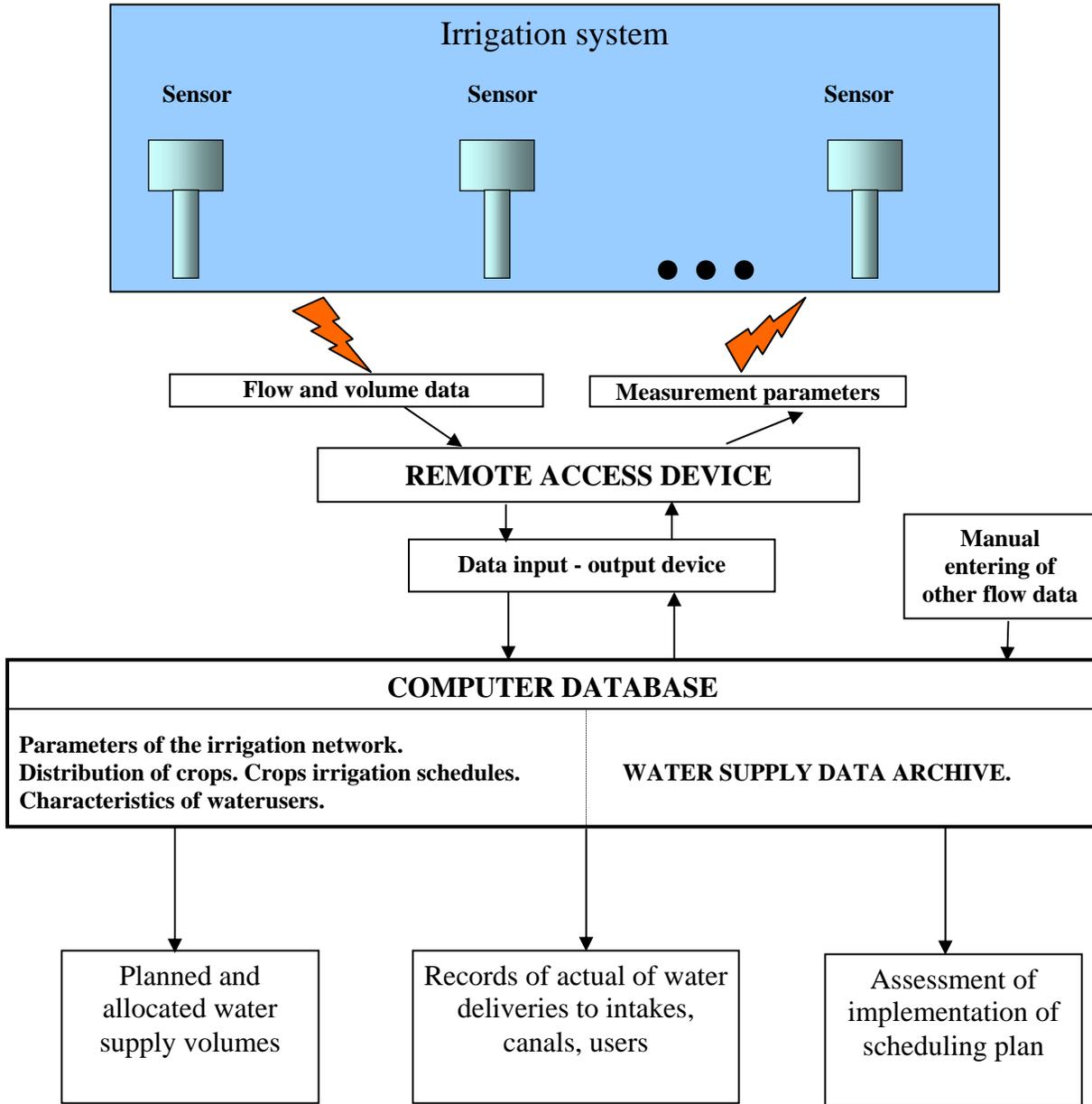
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Picture 1. Central Asian States depending on irrigation



Picture 2. Principal schema of automatic water flow monitoring system





Picture 3. Sensor installed on intake “Fixed channel”



Picture 4. Sensor on parabolic flume



No	Name of Control Unit, Location	Area (ha)	No	Name of Control Unit, Location	Area (ha)
1	WUA Sahi-Dare, Osh oblast	1263	2	WUA Ok Oltin, Fergana	3191
3	Case Model Farm, Tashkent oblast	215	4	WUA Amir Timur, Urgench	1727
5	WUA Berdakh, Karakalpakistan	2004	6	WUA Kushkulak, Syrdarya	1907
7	WUA Ok Koya, Syrdarya	2665			

Picture 5. Areas of testing "water flow monitoring system" in Central Asia.