Organization for Security and Co-operation in Europe
Centre in Bishkek

Research Report

On a fact finding survey of the Vorukh-Shurab drinking water supply system conducted in the framework of the OSCE project "Towards sustainable water usage and management in southern Kyrgyzstan" in co-operation with the Central Asia International Consulting Company (CAIConsulting)

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ABBREVIATIONS

ADB	Asian Development Bank
AWU	Association of Water Users
ARIS	Agency of Communities Development and Investments of the Kyrgyz Republic
WPR	Water Pipeline Route
KR JK	Jogurku Kenesh of the Kyrgyz Republic
KR LC	Land Code of the Kyrgyz Republic
KR	the Kyrgyz Republic
USSR MLDWR	Ministry of Land Development and Water Resources of the USSR
ICWC	Interstate Coordinating Water Committee
MALD	Ministry of Agriculture and Land Development of Kyrgyzstan
NSC	National Statistics Committee
NGO	Non-governmental Organization
OSCE	Organization of Security and Cooperation in Europe
PA	Public Association
PAWU	Public Association of Water Users
PFIT	Public Fund for International Tolerance
WSS	Water Supply System
CIS	Commonwealth of Independent States
SNiP	Construction norms and rules
RPADWU	Rural Public Association of Drinking Water Users
USSR	Union of Soviet Socialist Republics

TABLE OF CONTENT

1. Executive summary

- The subject matter of this Research is to carry out social and economic analysis of situation with the use of "Vorukh-Shurab"Water Pipeline Route (WPR), analysis of legal framework that regulates operation of this facility, and perform technical assessment of current condition of "Vorukh-Shurab" WPR with a view to develop a plan of actions to prevent intercommunity and transboundary tension and conflicts regarding joint use of this Water Supply System.
- "Vorukh-Shurab" WPR was built over forty years ago. It is physically deteriorated; at some places pipes are silted; there are breaks and leakage; water control valves were broken. Because of mud flows in Vorukh village three water storages, with capacity 1000m3 each, on the intake heading of pipeline route were sanded. After that, water to the pipeline route had been supplied directly from Isfara River. Water is never turned off in standpipes because it is supplied directly from the river and it helps to prevent water pipeline from silting, sanding and etc. In addition to multiple leakage and breaks and unauthorized hookups the above stated caused huge water losses.
- Regarding water shortage situation, the residents of the Kyrgyz and Tajik villages accused each other of irrational and non-targeted water use. Against this background clashes emerged between the Kyrgyz and the Tajik people. Mutual accusations by Tajiks and Kyrgyz regarding use of "Vorukh-Shurab" WPR acquire more aggressive tone and develop into unconcealed ethnic clashes, in some cases with the use of guns.
- "Vorukh-Shurab" WPR passes across the Kyrgyz settlements –Kapchygai area, Ak-Say, Uch-Dobo, Ak-Tatyr, and Jany-Bak. "Vorukh-Shurab" Water Pipeline Route supplies villages located outside the pipeline route, namely, new areas of villages Samarkandek, Tash-Tumshuk, Ortoboz, Pasky-Aryk. Therefore, nine villages of Kyrgyzstan are currently supplied by "Vorukh-Shurab"WPR.
- From the start of WPR operation population in villages increased manifold; villages expanded, and new settlements appeared, thus, provoking people for unauthorized hookups to "Vorukh-Shurab" Water Pipeline Route both in the Tajik enclaves and the Kyrgyz villages. Development of new territories was carried out without regard of the master development plan and expansion of village. No one tracked when and how new houses were built.
- In 2001 the joint Kyrgyz-Tajik Committee performed inspection of "Vorukh-Shurab" Water Pipeline Route and detected 110 hookups; only 15 hookups were permitted. Today, there are 24 permitted hookups to the WPR "Vorukh-Shurab" on the territory of Kyrgyzstan and 56 unauthorized. It was not possible to know the number of hookups on the territory of the Tajik enclaves within the course of the Research.
- Field works showed that except for Shurab City and parts of villages located on the end section of water passages from "Vorukh-Shurab" WPR, the problem of water shortage from "Vorukh-Shurab" WPR is not as pressing as other problems of this region typical for the Tajik and the Kyrgyz parties. Such problems include disputes related to access to resources (land, water, pastures, forestlands), territorial disputes (presence of disputed territories, development and takeover of disputed territories, which use is vetoed, issues of demarcation and delimitation of the state borders),border crossing issues (transboundary roads, frontier posts and actions of border guards, restrictions in movement of people, goods and services), actions of authorities, including law enforcement bodies, social and cultural relationships and ethnic tension, religion, transbounary crimes and lack of data.
- Analysis of legal framework regulating operation of "Vorukh-Shurab" WPR revealed that no Party has the legal property right for this facility. After collapse of the Soviet Union the property issues were not considered by appropriate agencies and were not submitted for consideration by the bilateral Kyrgyz-Tajik Intergovernmental Committee, which is empowered to make specific decisions. Specific efforts were undertaken at the local level in order to settle operational issues and repair the water passage. However, proprietary and ownership issues could not be settled because of poor competence of local bodies in settlement of issues at such level.

- Regulatory acts of local level regulating operation of "Vorukh-Shurab"WPR, for the most part, do not comply with the standards of drafting acts for such purpose and are rather a sort of protocols on intentions to cooperate between the Parties, without securing any rights and duties, and responsibility procedures.
- Water measurements performed under the Project allow seeing a real picture of water losses on "Vorukh-Shurab"WPR. The fundamental causes having an effect on less water supply to end-consumers are the following:
    - Too much hookups and taps, including illegal.
    - Lack of proper operation of Water Pipeline Route and timely repair and rehabilitation works on pipeline sections surveyed. There are a lot of leakages. It should be noted that gate valves to disconnect pipeline for performance of repair works are destroyed, and there are considerable leakages at the gate valves sites. Preventive works for cleaning and discharge of sand sediments along Water Pipeline Route are not performed. That is why, there is silting and reduced discharge capacity of water pipeline on the lower sections. The pipeline has inner sediments because of drop of geodetic altitude between Point 4 and Shurab City.
    - Water intake facility is constant within 24 hours and has little variations. This is mostly because there are no shut-off and control valves at the places of pipeline connections.
- Analysis of data received allowed to determine the most problematic route sections. First of all, this is the Tajik section of "Vorukh-Shurab"WPR, which passes along Surkh and Chorkhu (water losses about 9400 m3/day) and the Kyrgyz section of "Vorukh-Shurab"WPR, which goes across Samarkandek village council territory (water losses are 13200 m3/day). The principal cause for water losses on these sections is high density of housing developments and, consequently, unauthorized hookups. Meanwhile, these sections are located at the lowest points, and if there is a hookup with no control valve in place, discharge through 20mm pipe would be 1-2 liter/second. This is a considerable indicator. In addition, there are huge losses at the water pipeline sections in critical condition.
- Technical assessment of water intake from "Vorukh-Shurab" WPR showed that water withdrawal from Isfara River is done outdoor, through perforated pipeline with trash net. Water thaws at two horizontal sequential settlings. At the moment of survey, the settlings were strongly silted. Settlings are operated in violation of technological regime;
- No water disinfection in place. Current water intake facilities do not meet sanitary requirements of normative documents for cleaning and supply of drinking water to consumers.

2. Introduction

Batken Oblast is located in the south-western border region of Kyrgyzstan and is one of the conflict-prone areas. Three fourth of borders of Batken Oblast are international. Oblast borders on Tajikistan in the south, west and northwest, Uzbekistan in the north and Osh oblast in the east. The area of oblast is 17.0 thousand km2 or 8.5% of the country's territory. Political specifics of the territory are Tajik enclaves on the territory of Kyrgyzstan. Available water and land resources in this region are in public domain by residents of Kyrgyzstan and Tajikistan.

Transboundary system of joint drinking water supply begins from the territory of Tajik enclave Vorukh and supplies water to Shurab City of Isfara rayon, Tajikistan, crossing territories of Ak-Say, Ak-Tatyr and Samarkand village councils of Batken oblast of Kyrgyzstan and goes across the Tajik village Khodzha-Ailo (Matchoi). Over the last 10 years water has almost stopped flowing to the city and it led to tensed relations between local communities on both sides of the border.

This problem remains unresolved for 20 years, because local authorities of Kyrgyzstan and Tajikistan could not develop a mechanism for shared use of water pipeline route, while legal obligations of the Soviet period have not been modified in accordance with current conditions of two independent states –

Kyrgyzstanand Tajikistan. This situation has been kept for 20 years and, every year, it has been aggravating and interlacing with other factors, thus, contributing to formation of conflict potential in this region. Residents of border villages keep blaming each other in irrational use of drinking water. It happens due to lack of information and because from the moment of getting independence by Kyrgyzstan and Tajikistan no party carried out technical assessment of condition of drinking water supply facility Vorukh-Shurab, did not take any measurements of water quantity in a pipeline, which could become the basis for impartial estimate of the amount of drinking water consumption by each party.

OSCE initiated research of "Vorukh-Shurab" Water Pipeline Route within the framework of the Project for Sustainable Use and Management of Water Resources in the South of Kyrgyzstan. The objective is to acquirereliable empirical data on the current condition of water pipeline and water consumption pattern, so that to assist the Parties concerned, the government bodies of Kyrgyzstan and Tajikistan in elaboration of a positive solution. This solution could facilitate with prevention of inter-communal and transboundary tension and conflicts concerning shared use of "Vorukh-Shurab" Water Pipeline Route.

The Project was launched in April 2012. During five (5) months the group of experts worked under this Project to carry out social and economic analysis, review and analyze regulatory documents that regulate use of water resources in the south of Kyrgyzstan, and perform technical assessment of condition of "Vorukh-Shurab" Water Pipeline Route.

This Report was prepared following the requirements of Terms of Reference of OSCE's Project "Sustainable Use and Management of Water Resources in the South of Kyrgyzstan".

The Report covers social and economic, legal and technical aspects, which present summarized results of work of the expert group of consultants of "CAIConsulting" company on complete survey of Vorukh-Shurab water passage. Findings and recommendations on all works performed are included.

The Report contains:

- results of social and economic analysis of villages of Kyrgyzstan supplied from "Vorukh-Shurab" WPR;
- analysis of all existing local, national and intergovernmental legal agreements regulating water relations, and, in particular, operation of this drinking water supply facility;
- developed suggestions on payment for water transit;
- determination of water flow on the basis of sampling measurements performed;
- cost estimate of rehabilitation and technical costs for capital repair;
- cost estimate and description of water use models on the basis of water metering;
- economicfeasibility of selected options and required budget to improve operation of "Vorukh-Shurab" WPR.

3. Social and Economic Analysis

The Report on results of research conducted by an expert on social and economic analysis contains:

- statistical demographic and current social and economic data for villages supplied from "Vorukh-Shurab" WPR;
- background of "Vorukh-Shurab" Water Pipeline Route and its current condition;
- information on "Andigen-Suu" water pipeline, as an alternative source of water for the Kyrgyz communities;
- information about attempts to settle issues related to use of "Vorukh-Shurab" Water Pipeline Route;
- Findings and recommendations on joint use of "Vorukh-Shurab" and "Andigen-Suu" Water Pipeline Routes.

The following methods of data collection and analysis were used for implementation of the tasks set:
- Content analysis of secondary information (reports, articles, publications, preliminary report of field survey of water supply facility "Vorukh-Shurab" by an expert group of CAIConsulting company, statistical data, contracts, bilateral agreements, etc.);
- Official requests to statistical bodies, local self-government bodies;
- Field surveys: interviews with key focal points from local self-government bodies, government bodies and public organizations; discussions; observation.

3.1. The Process of Research

Pursuant to Terms of Reference and methodology the Research was launched from collection of secondary information. Requests were made to the National Statistical Committees of the Kyrgyz Republic and Tajikistan, village councils, "Andigen-Suu"Public Association, and Association of Water Users (AWU). Quantitative and qualitative data were received during collection of secondary information.

The National Statistical Committee of the Kyrgyz Republic (KR NSC) could not provide requested information about settlements supplied from "Vorukh-Shurab" WPR. Therefore, the decision was made to request data at Batken Rayon State Statistics Department. This Department informed that they can provide data with breakdown by rayon. As long as specific villages were under review, which were supplied from "Vorukh-Shurab" WPR, data was needed specifically on these villages. It was decided to collect data at the level of village councils.

Secondary information collected allowed to make a list of government bodies, local self-government bodies, public organizations concerned, which work in area of water-use in the south of Kyrgyzstan, so that to held in-depth interviews. The list of village councils that are directly or indirectly connected with operation of water supply facility on the territory of Kyrgyzstan was formed in order to carry out a possible sample survey of population supplied from "Vorukh-Shurab" WPR. The tools for social and economic analysis of the region's situation were elaborated. It enabled to proceed to collection of primary information.

Because no technical documentation for "Vorukh-Shurab" WPR was received, the expert made the decision to find out water consumption rate by population and determine water amount consumed by population of Kyrgyzstan's villages by empirical way. For this purpose, a questionnaire for water consumers was formulated to receive data regarding amount of consumed drinking water, amount of water used for household purposes, domestic animals, irrigation of household plots, vegetable gardens ad orchards.

Primary data was collected in the course of field works. Official meetings were conducted with heads of Ak-Say, Ak-Tatyr, Samarkandek village councils, head of ayils, a representative of "AndigenSuu" Public Association, AWU and village residents. Heads of village councils produced the"passports" (profiles) of their village councils.

Photo 1. Interview with Appazov S., Acting Head of Village Council "Samarkandek"

Photo 2. Interview with Khudoyarov K., Chairman of "Andigen-Suu" PA

At the first field survey and observation of villages it was immediately revealed that water in public stand-pipes is not turned off. It was found out that this is done deliberately, and water in stand-pipes runs all the year round. In the process of field works an attempt was made to count water quantity consumed by Kyrgyzstan's population by empirical way. For this purpose, water intake facilities were examined and maps of Ak-Say, Uch-Dobo, Ak-Tatyr and Zhany-Bak villages were drawn, including marked authorized water stand-pipes, unauthorized hookups and pipe diameter (Attachment # 1-4).

In order to find out the cause for water shortage in the region, except leakage and other technical aspects, it was necessary to identify population size living at the moment of construction of "Vorukh-Shurab" WPR, because over forty-year period of operation of "Vorukh-Shurab" WPR not only existing villages expanded, but also new settlements emerged. For this purpose, the request to the NSC on population size according to census was made. However, the NSC provided data about villages only for 2009 and 1999with breakdown of Batken oblast. The KR NSC did not have data of previous censuses available because documents prepared before 1991 were transferred to the state archive. That is why, one more attempt to find forty years old data on population size was made. The Collection of the First National Population Census was available in the library. This Collection contained data on population size in 1970, 1979 and 1989 years with breakdown of Batken oblast.

Thanks to CAIConsulting office in Tajikistan we acquired data on population size of Vorukh and Khodzha-Ailo enclaves, gender and age population structure, cultural and educational and social facilities, rural infrastructure facilities, trade and manufacturing facilities and enterprises.

3.2. General Information on "Vorukh-Shurab" Water Pipeline Route

Protocol between the Kyrgyz kolkhoz "Ravat" and mine office "Shurab" "On allocation of Irrigated and Dry Land for Construction of Drinking Water Pipeline Route "Vorukh-Shurab" was composed in 1965 between the Kyrgyz Soviet Socialist Republic and the Soviet Socialist Republic of Tajikistan for endorsement of water resources use. In accordance with this Document, 14.5 ha of land were allotted for construction of water pipeline by the Kyrgyz side, including 2 ha of irrigated and 11.5 ha of dry land. "Vorukh-Shurab" Water Pipeline Route was built in 1969. Its length was 32 km, discharge capacity – 210 l/sec. 14 km of water pipeline route go through the territory of Kyrgyzstan, the other 18 km across settlements of the Republic of Tajikistan[1].

[1] KyrgyzstansExperienceofDevelopmentofPartnershipbetween theStateandCivilSocietyOrganizations. AKDN (AgaKhanDevelopmentNetwork). Bishkek, 2007, page 205.

This water pipeline route was designed for Shurab settlement in Tajikistan. Shurab was a mining town with population of 18 thousand people. 70% of population was ethnic Kyrgyz. "Vorukh-Shurab" Water Pipeline Route was the only source of drinking water and it was used for drinking and household purposes, as well as for irrigation of household plots. Design capacity of Water Pipeline Route was estimated in accordance with needs of 1969.

"Vorukh-Shurab" WPR runs across the territory of Tajikistan through settlements of Vorukh Jamoat and Khodzha-Ailo village, and on the territory of Kyrgyzstan, through settlement of Kapchygay and Ak-Tatyr village. Pursuant to bilateral agreement between Kyrgyzstan and Tajikistan (dated November 03, 2012),five wells for withdrawal of drinking water were authorized to be installed on the Kyrgyz territory for Kapchygay, Ak-Tatyr, Ortoboz and Samarkandek villages (pipe diameter – 100 mm) and for vocational school (pipe diameter – 60 mm). "Vorukh-Shurab" Water Pipeline Route became the only drinking water source for several villages of Kyrgyzstan and Tajikistan, and in some villages it was used for irrigation needs.

Water is supplied under gravity due to large drop of altitude between Vorukh and Shurab, thus, producingextreme pressure in the main pipe. This pressure is so strong, that water in water intake pipes rises higher than a level of water main pipe and moves to upland.

As a result of deep transformational changes followed after collapse of the Soviet Union and beginning of the civil war in Tajikistan, outflow of population from Shurab town, particularly of ethnic Kyrgyz, has started. They began to settle along "Vorukh-Shurab" WPR with no authorization given,and formed new settlement Zhnay-Bak. Since this territory was virgin, there were no any infrastructural facilities and, what is the most important thing, there was no water. That is why population started to cut into "Vorukh-Shurab" Water Pipeline Route arbitrarily. Water intake inlets had been directly extended till their households. Drinking water from Water Pipeline Route was used for irrigation of household plots. Early 2000 there were 30 households in Zhany-Bak. Subsequently, this settlement received the status of village and was referred to Samarkandek Ayil Okmotu. Because residents of Zhany-Bak village mainly came from Shurab town they believe that they have the right to use "Vorukh-Shurab" WPR as initially water pipeline route was designed for residents of Shurab town.

Over the time residents of the Kyrgyz and Tajik settlements located along "Vorukh-Shurab" WPR established unauthorized water withdrawal by arbitrarily hookups. Residents of Shurab town started experiencing water shortage, especially during summer period, from May 15 to September 15, and were forced to buy water, which was delivered to the town in tanks. Dehydration and water-related tension in Shurab town caused discontent and was expressed by mutual accusations between Tajik and Kyrgyz communities in excessive and above-limit consumption of drinking water.

"Vorukh-Shurab" Water Pipeline Route was managed by Public Utilities Service of the Mine Administration of Shurab town before collapse of the Soviet Union[2]. All costs for operation of water supply system were covered by Public Utilities Service, which was on the books of the Mine Administration. At present, management system of "Vorukh-Shurab" WPR still exists, and its operation and maintenance is performed by the Public Utilities Service. According to interview, the management of the Public Utilities Service frequently changes. Such changes impede to implement arrangements signed between local authorities of Tajikistan and Kyrgyzstan.

Moreover, unauthorized hookups to "Vorukh-Shurab" Water Pipeline Route cannot be done without authorization of the Public Utilities Service.

"Vorukh-Shurab" WPR was built over forty years ago. It is physically deteriorated; at some places pipes are silted; there are breaks and leakage; water control valves were broken. Because of mud flows in Vorukh village three water storages, with capacity 1000m3 each, on the intake heading of pipeline route were sanded. After that, water to the pipeline route had been supplied directly from Isfara River[3]. Water is

[2]UNDPreport (Tajikistan) "PotentialforPeaceandThreatofConflicts: AnalysisofDevelopmentofBorderCommunitiesofIsfanaRegionofTajikistan (JaomatVorukh, Chorkukh, SurkhandShurab) andBatkenregionof Kyrgyzstan (Ak-Say, Ak-Tatyr and Samarkandek)", page 8, July 2011

[3]Interviewwithkeyinformer.

never turned off in standpipes because it is supplied directly from the river and it helps to prevent water pipeline from silting, sanding and etc. In addition to multiple leakage and breaks and unauthorized hookups the above stated caused huge water losses.

Photo 3. Breakdown in "Vorukh-Shurab" Water Pipeline Route

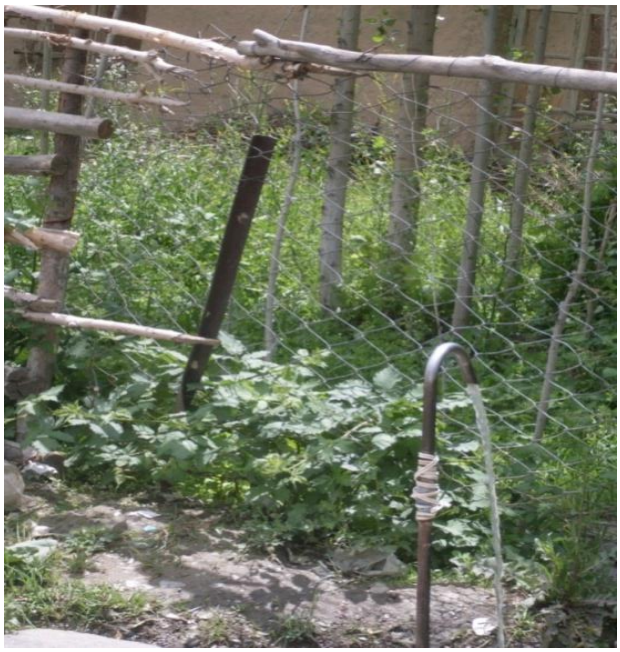


Photo 4. Public stand-pipe in Ak-Tatyr village

Shurabcity, for which "Vorukh-Shurab" WPR was the only water source, was the first settlement which experienced water deficit. Since water from Water Pipeline Route has been used for all needs of residents, in particular, for irrigation of household plots, residents could not grow anything on these plots anymore and had lost small, but extra food source. It has also caused departure of population from Shurab town, increased dissatisfaction of the Tajik population and emergence of concealed ethnical water-use conflict. This was expressed by the negative attitude to the Kyrgyz people living in Shurab town from the Tajik population, which was demonstrated by inadequate water provision of blocks occupied by the Kyrgyz people, employment of the Kyrgyz people, and access to decision-making process at the local level[4].

Water shortage was also experienced in new settlements of Kyrgyzstan, especially in settlements located at the end of water channels, in particular, in Paska-Aryk village where only 4-5 public stand-pipes were installed. In the situation of water shortage, the residents of the Kyrgyz and Tajik villages started blaming each other in irrational and improper water use. Clashes between Kyrgyz and Tajik people have started. Mutual accusations by Tajiks and Kyrgyz regarding use of "Vorukh-Shurab" WPR acquire more aggressive tone and develop into unconcealed ethnic clashes, in some cases with the use of guns. Clashes also frequently happen between employees of the Public Utilities Service of Shurab town and population of the Kyrgyz communities.

At present, "Vorukh-Shurab" WPR passes through the following settlementsin Kyrgyzstan: Kapchygayarea, Ak-Say, Uch-Dobo, Ak-Tatyr and ZhanyBak villages. "Vorukh-Shurab" Water Pipeline Route also supplies villages located outside the water pipeline route - new areas of Samarkandek village, Tash-Tumshuk village, Ortoboz, Paska Aryk. Thereby, at present time nine villages are supplied from "Vorukh-Shurab" WPR.

[4]Interview with a former resident of Shurab town.

Table 1: Villages Supplied from "Vorukh-Shurab" WPR

#	Village	Village council	Water distribution	
			"Vorukh-Shurab" Water Pipeline Route	"Andigen-Suu" Water Pipeline
1	Kapchygay	Ak-Say	100%	
2	Ak-Say	Ak-Say	100%	
3	Tash-Tumshuk	Ak-Say	100%	
4	Uch-Dobo	Ak-Say	Lower part of village (60%)	Upper part of village (40%)
5	Ak-Tatyr	Ak-Tatyr	Lower part of village (50%)	Upper part of village (50%)
6	Ortoboz	Ak-Tatyr	100%	
7	Zhany-Bak	Samarkandek	100%	
8	Samarkandek	Samarkandek	70%	30%
9	PaskaAryk	Samarkandek	100%	

From the moment of WPR functioning, the population in villages increased manifold; villages enlarged, new settlements appeared, thus, provoking people for unauthorized hookups to "Vorukh-Shurab" Water Pipeline Route both in the Tajik enclaves and the Kyrgyz villages. Development of new territories was carried out without regard of the master development plan and expansion of village. No one tracked when and how new houses were built.

As a result, not only the standards of security area around water pipeline route were violated, but also developments were made over it. Water Pipeline Route was turned to be under residential houses, outdoor buildings, vegetable gardens and orchards. It complicates and even makes impossible to inspect water pipeline route and do any repair works.

Photo 5. Unauthorized hookup was extended to the house built on virgin land along water pipeline route.

Photo 6. House of former resident of Shurab town.

A unique feature of this region is that village residents use irrigation water for drinking and household needs in places with no water pipelines. People often confuse issues of irrigation water shortage with drinking water shortage. Even if a village had never been supplied from "Vorukh-Shurab" WPR, the issue of water shortage on this water pipeline route still emerges. In particular, it relates to Tajik village Chorkhu.

In the process of field works it was identified that except for Shurab City and portions of villages located on the end section of water passages from WPR "Vorukh-Shurab", the issue of water shortage from "Vorukh-Shurab" Water Pipeline is not as pressing, as other issues of this region typical for the Tajik and Kyrgyz parties. It includes disputes on access to resources (land, water, pastures, forestlands), territorial disputes (presence of disputed territories, development and takeover of disputed territories, which use is vetoed, the issues of demarcation and delimitation of the state borders), border crossing issues (transboundary roads, frontier posts and actions of border guards, restrictions in movement of people, goods and services), actions of authorities, including law enforcement bodies, social and cultural relationships and ethnic tension, religion, transbounary crimes and lack of data[5].

As mentioned in interview with the Head of village council of Samarkandek village "the Tajik party often confuses frontiers and water issues"[6]. This situation contributes to conflictogenity in the region under review.

3.3. Social and Economic Analysis of Situation in VillagesSupplied from "Vorukh-Shurab" Water Pipeline Route

Early 2011 4441.1 thousand of people or 8% of the country's population lived in Batken oblast. Territory of Batken oblast is 17 thousand square meters or 8.5% of the country's territory. Population density is 25.9 persons per 1 square meter, and Batken oblast holds the fourth place among seven oblasts of the Republic per population density[7]. Population density is low in the mountain regions; it is much higher in valleys and along the state border with Tajikistan. High birthrate, low death rate, high natural increase and the significant level of migration over the last decade is typical for this oblast.

Table 2:Growth Trend of De Facto Population in Batken Oblast[8]

	Years					
	1959	**1970**	**1979**	**1989**	**1999**	**2009**
Total	149335	199804	237508	313196	380142	380256
Urban	66384	71271	74495	81897	74577	92751
Rural	82951	128533	163013	231299	305565	287505
Growth rate of rural population		1,5	1,3	1,4	1,3	0,9

Over the period from 1970 to 2009 population in Batken oblast increased by 180452 people or by 2.2 times. In 1970 rural population share was 64% of total population size, and in 2009 – 75.6. Average population growth rate was 1.28. Increase of rural population took place because of natural population growth and migration.

Table 3:Growth Trend of Population in Batken Rayon

	Years					
	1959	**1970**	**1979**	**1989**	**1999**	**2009**
Size	18119	28553	38434	55799	64624	69300
Growth		1,6	1,3	1,5	1,2	1,1

According to data of 1970 population census the share of population of Batken rayon was 14% of all population of Batken oblast. Following 2009 population census this share was 17.8%. Population of

[5]UNDPreport (Tajikistan) "PotentialforPeaceandThreatsofConflict: DevelopmentAnalysis of Cross-BorderCommunitiesofIsfaraDistrict of the Republic of Tajikistan (JaomatVorukh, Chorkhu, SurkhandShurab) andBatkenDistrict of Kyrgyzstan (Ak-Say, Ak-Tatyr and Samarkandek)", page 8, July 2011
[6]InterviewwithExecutiveHeadofSamarkandek village council, Appazov S.
[7]Demographic annual publication of the Kyrgyz Republic over 2006-2010, page18, Bishkek 2011
[8]PopulationcensusofBatken oblast, 2009

Batken rayon increased by 2.4 times over the period from 1970 to 2009. Average population growth over the period between censuses of 1970 and 2009 was 1.34.

3.3.1 Ak-Say Village Council

Ak-Say village council is located in the south-west of Batken rayon. Four villages are part of Ak-Say village council -Ak-Say with Kapchygayarea, Tash-Tumshuk, Uch-Dobo and Kok-Tash. All villages of this village council are supplied from Water Pipeline Route, except Kok-Tash village and part of Uch-Dobo village. The lower area of Uch-Dobo village is supplied from "Vorukh-Shurab" WPR and the upper area - from "Andigen-Suu" Water Pipeline.

Ak-Say is a center of village council. Village was founded in the early 80ies of the last century for strengthening Kyrgyzstan's borders. Sovkhozwas founded for development of goat breeding. Standard houses, schools and other institutions of social and cultural life were built. Land was distributed to bring population to sovkhoz. New settlers of sovkhoz were mainly young people from Kapchygayarea and migrants from Shurab town.

Table 4:Population Size in Ak-Say Village Council Supplied from "Vorukh-Shurab" WPR[9]

Village	Population census as of January 1						
	2009	2010	2011				
	Total	Total	Total	Including:		Temporarily absent	Number of families
				Male	Female		
Kapchygayarea (Ak-Say village)	594	711	922	411	511	132	146
Ak-Say village	1166	1197	1221	620	601	109	326
Tash-Tumshuk village			625	308	317	13	148
Uch-Dobo village	1347	1673	1976	926	1050	208	517
Total	**3107**	**3581**	**4744**	**2265**	**2479**	**462**	**1137**

As of January 1, 2012, total population size of four villages of Ak-Say village council supplied from "Vorukh-Shurab" WPR was 4744 people.

3.3.2. Ak-TatyrVillage Council

Ak-Tatyr village council is located in the western part of Batken rayon. It borders on Samarkandek village council in the north, the Republic of Tajikistan in the east, the Republic of Tajikistan and Ak-Say village council in the south and Leylekrayon of the Kyrgyz Republic in the west. Four villages form Ak-Tatyr village council: Ak-Tatyr, Orto-Boz, Ravat, Yntymak. Only two villages out of four of Ak-Tatyr village council are connected to "Vorukh-Shurab" WPR -Ortoboz village, which is fully supplied from "Vorukh-Shurab" WPR and the lower area of Ak-Tatyr village. Upper area of this village is supplied from "Andigen-Suu" Water Pipeline.

Ak-Tatyr village is a center of village council. Ak-Tatyr village council was separated from Samarkandek ayilokmotu in 2001.

[9]DataofBatkenRayonState StatisticsDepartment

Table 5: Population SizeofAk-TatyrVillage Council Supplied from "Vorukh-Shurab" WPR[10]

Village	Population census as of January 1						
	2009	2010	2011				
	Total	Total	Total	Including:		Temporarily absent	Number of families
				Male	Female		
Ak-Tatyr	2525	3112	3365	1670	1695	697	838
Ortoboz	762	901	909	467	442	168	271
Total	**3287**	**4013**	**4274**	**2137**	**2137**	**865**	**1109**

As of January 1, 2012 total population of two villages of Ak-Tatyr village council supplied from "Vorukh-Shurab" water pipeline route is 4274 people.

3.3.3. Samarkandek Village Council

Samarkandek village council is located in the western part of Batken rayon. Village council borders on Shurab city in the north-west (Tajikistan), Chorkukh village in the south (Tajikistan), Surkh village in the east (Tajikistan) and Ak-Tatyr village council and Leylek district in the west.

There are three villages in Samarkandek village council -Zhany-Bak, Paska-Aryk and Samarkandek. Zhany-Bak and Paska-Aryk villages are fully supplied from "Vorukh-Shurab" WPR. Samarkandek village is supplied by 70% from "Vorukh-Shurab" WPR and 30% from "Andigen-Suu" Water Pipeline.

Samarkandek village consists of Zhayilma, Orto-Say, Chek and Bazar-Bashiareas. There is Min-Orukarea on the territory of Paska-Aryk village. Kelechekarea is a part of Zhany-Bak village.

Table 6:Population Size of Samarkandek Village CouncilSupplied from "Vorukh-Shurab" WPR[11]

Village	Population census as of January 1						
	2009	2010	2011				
	Total	Total	Total	Including:		Temporarily absent	Number of families
				Male	Female		
Samarkandek	5442	5529	5624	2824	2800	231	1446
Paska-Aryk	2461	2733	2833	1425	1421	164	669
Zhany-Bak	1388	1759	1896	963	933	120	482
Total	**9291**	**10021**	**10366**	**5212**	**5154**	**515**	**2597**

As of January 01, 2012 total population size of three villages of Samarkandek village council supplied from "Vorukh-Shurab" WPR is 10366 people.

Population of Ak-Say, Ak-Tatyr and Samarkandek village councils, as of January 01, 2009, is 15685 people. Ratio of population of these villages was 22.3% oftotal population size of Batken rayon. Thus, population of villages supplied from "Vorukh-Shurab" WPR composes the significant part of population of Batken rayon.

Because over the period from 1970 to 2009population of Batken region increased by 2.4 times,in 1970 population of villages supplied from "Vorukh-Shurab" WPR was 6535 people (15685 people, i.e. increased by 2.4 times).

Population size of villages supplied from "Vorukh-Shurab" WPR, as of January 1, 2012,was 19384 people, temporarily absent – 1842, number of families – 4843. When assuming that there are, at least, five people in a family, theoretically, population size should be 24215. Unaccounted population who can be considered as labor migrants constitute 2989 people. In fact, 4831 people are in labor migration. These

[10]DataofBatkenRayonState StatisticsDepartment
[11]DataofBatkenRayonStateStatisticsDepartment.

calculations are confirmed by data on migration of the country[12]. Thus, 25% of total number of village population supplied from "Vorukh-Shurab" WPR are labor migrants.

Table 7: Gender and Age Structure of Village Population Supplied from "Vorukh-Shurab" WPR[13]

Village council	0-17 years	18-59	60 years and more
Ak-Say	1709	1997	694
Ak-Tatyr	1289	2592	137
Samarkandek	4707	4559	585
Total	**7705**	**9148**	**1416**

Population of villages supplied from "Vorukh-Shurab" WPR, at the age from 0 to 17 years, composes 42.2%, at the age from 18 to 59 years – 50.1%, and at the age above60 years – 7.8%[14]. It makes us to come to an assumption that working-age population is in labor migration, whereas children were left under custody of grandparents. It is also confirmed by the survey. In the family with four children of one of respondents, parents are in labor migration, and their children were left with grandparents.

Direct effect of labor migration is shortage of labor resources, which in addition to high disparity of prices on agricultural inputs and prices of agricultural products leads to high costs of growing of agricultural products. Large-scale labor migration resulted in the situation when elderly men, children and women are left in villages and no one can cultivate land and gardens. As a result of this, high amount of land under crops and orchards are not cultivated. Population prefers to live at the expense of money transfers of labor migrants.

Photo 7. "Abandoned" orchard

Photo 8. Uncultivated field

According to statistical data 33518 people out of 47325 or 65% of ethnic Tajiks residing in Kyrgyzstan, live in Batken oblast. It makes up 7% of total population size of Batken oblast[15]. According to 2009 population census total number of ethnic Tajiks in villages supplied from "Vorukh-Shurab" WPR is 5%[16].

According to the Head of Samarkandek village council, the Tajik population despite conflictogenity of this region prefers having the Kyrgyz passport (citizenship), because labor migrants from Kyrgyzstan

[12]According to the official statistics, 500 thousand people are in labor migration outside of the country, and according to experts – about 1 million people.
[13]DataofBatkenRayonStateStatisticsDepartment.
[14]According to UN data population is considered as old, if the share of those who over 65 years old is more than 7%.
[15]Demographic annual publication of the Kyrgyz Republic, 2006-2010, page 101, Bishkek 2011
[16]Data of population census, 2009

enjoy more simplified registration system in Russia. In addition, uncultivated lands of labor migrants are rented by Tajik people, either citizens of Kyrgyzstan or citizens of Tajikistan.

During the field survey, it was determined that 70% of residents of Tash-Tumshuk village are ethnic Tajiks and 30% are ethnic Kyrgyz. The process of decrease in number of ethnic Kyrgyz in Tash-Tumshuk village keeps growing. Currently, this village looks like "a chessboard" where houses of ethnic Tajik and Kyrgyz stand alternately. This process is also typical for other villages of this region, but it is most rapidly growing in villages that border on Tajik villages. This situation will generate conflictogenic setting, when the process of delimitation and demarcation of borders would be initiated.

According to expert assessment increase of number of ethnic Tajiks is a result of "creeping" migration. As noted in UNDP report (Tajikistan),from early 2000, the booming migration process of population of Kyrgyzstan to economic developed regions of the country is observed. This led to large-scale outflow of residents in the Kyrgyz cross-border communities that enabled illegal transactions on purchase and sale of land plots[17]. Citizens of Tajikistan purchase houses and land plots of the Kyrgyz people, and sometimes they seize the areas illegally. Local state administration secretly encourages these actions by issuance of backdated legal documents for land and real estate. One year later new owners pay state taxes and fees. Meanwhile, local Jaomats help fellow citizens to buy up houses of the Kyrgyz people and quickly build temporary premises. "When the Kyrgyz sell their land, the Tajik give as much money as the Kyrgyz want, even without bargaining"[18]. In future, after completion of demarcation of borders, legally unexecuted transactions may lead to new conflict situations.

3.4. Economic Situation

Table 8:Land of Village Councils[19]

Village council	Total of land (ha)	Including				
		Irrigated	Dry	Perennial	Pastures	Household plots
Ak-Say	3711	237	226	193	2900	155
Ak-Tatyr	3547	105,5	525	117	2800	
Samarkandek	5268	248	1080	272	3668	

Share of irrigated land per one person is 0.03 ha. Only in Ak-Say village land share is 0.08 ha. Residents of Batken oblast have the lowest land shares per person as compared with other oblasts. 482 families out of 1256 do not have land shares in Ak-Say village council, 15 families do not have land share in Ak-Tatyr village council.

Principal activity of residents of this region is agriculture. Over the last years villagers stress that livestock breeding is the main income source. It is confirmed by ACTED survey performed with USAID assistance. Due to money transfers by labor migrants the number of livestock increased[20]. However field surveys showed that not every family owns cows, as the source of food. However, there is population share that keep cows in order to produce and sell milk and dairy products. Trend for decrease of number of sheep is marked over the last years, whereas the number of goats increases. It is related to the forage supply.

[17] UNDP Report (Tajikistan) "Potential for Peace and Threats of Conflict: Development Analysis of Cross-Border Communities ofIsfara District of the Republic of Tajikistan (Jaomat Vorukh, Chorku0h, SurkhandShurab) and Batken District of Kyrgyzstan (Ak-Say, Ak-Tatyr and Samarkandek)", page 9, July 2011.

[18] Internet-material: http://kabar.kg/index.php/analytics/full/19152

[19] Passport (profile) data of Ak-Say, Ak-Tatyr and Samarkandek village councils.

[20] ACTED survey. P-code 41705214849010

Table 9:Livestock as of early 2012[21]

Village councils	Livestock	Horses	Sheep and goats	Poultry
Ak-Say	4046	52	19673	3537
Ak-Tatyr	2949	117	15125	5160
Samarkandek	2261	26	14224	4999
Total	**9256**	**195**	**49022**	**13696**

Despite the fact that livestock breeding is considered by residents as the principal income-generating activity, the number of domestic animals per one family is much lower in comparison with other regions of Kyrgyzstan. It is mainly caused by the limited quantity of forage. Non-observance of standards of livestock grazing on pastures results in gradual degradation and destruction of pastures. This aggravates the existing factor of joint use of pastures. With the assumption that each family has a cow, the major portion of livestock grazing on pastures belongs to Tajiks.

Crop production remains to be low efficient. The vector of problems in crop production come together in Batken oblast, namely, shortage of land, high agricultural input costs, critical shortage and physical and moral deterioration of agricultural equipment, remoteness from central markets, irregular provision with irrigation water. For historical reasons, irrigation water comes to villages of Ak-Tatyr village council from Tajikistan. Irregular provision with irrigation water led to decrease of crop productivity over the last 10 years.

Table 10: Infrastructure[22]

Village councils	Cars	Trucks	Motorcycles	Cartage	Tractors	Detachable equipment
Ak-Say	341	48	16	12	2	15
Ak-Tatyr	250	20	9	4	12	
Samarkandek	292	60	29	-	-	22

Considerable number of motor cars is connected with the activity of labor migrants. Other equipment with minor exceptions is outdated physically and morally. Lack of sufficient quantity of agricultural machinery is the key factor of low profitability of agricultural production that enables people to seek for other income sources, in particular, go for labor migration.

3.5. Social Status

There are 876 poor families[23] in Ak-Say village council of 1738[24]. This is more than 50% of population. 1326 people in the village council have income of KGS140 per month, 1958 people – from KGS140 to 400 per month. 867 families are attributed to the category of poor in Ak-Tatyr village council. The number of families with the level of average per capita income ofKGS140 per month constitutes 50.6%, the level of average per capita income from KGS141 to KGS400– 39.3%, the income level from KGS401 to 600 – 10.1%. Thus, 50.7% families in this village council live below the poverty line.

Residents of this region experience severe deficit of land for residential construction. So far, 16 families in Ak-Say village council have houses with all facilities, 256 families have houses with partial facilities, 1288 families live in temporary structures, 48 families live in apartments and 133 families or 8% of families live with parents. 867 of 1592 families in Ak-Tatyr village council do not have houses with minimal conditions for comfort residence. They have to live with parents or in temporary structures,

[21]Passport (profile)dataofAk-Say, Ak-Tatyr and Samarkandek village councils.

[22]DataofBatkenDistrictDepartmentofStateStatistics
[23]Povertycriteria, usedbyNSC KR
[24]Passport data of Ak-Say village council

unfinished non-commissioned houses or they have already received land plots for construction but because of lack of money they cannot build a house. This category of families mainly consists of young families. And this is the main reason for the youth to leave for labor migration. Thus, the issue on quantity and availability of land is one of the conflictogenic factors in the region.

3.6. Tajik Enclaves

It is noted in the UNDP report (Tajikistan) "Potential for Peace and Threats of Conflict: Development Analysis of Border Communities of IsfaraDistrict of Tajikistan (Vorukh, Chorkukh, Surkh and Shurab) and Batken District of Kyrgyzstan (Ak-Say, Ak-Tatyr and Samarkandek)" that the key problem of Tajik villages is access to resources (land, water, pastures, forests). Previously, the results of surveys and analysis of conflicts illustrated that problems of access to water and distribution of water resources are the principal conflictogenic factors. Today, according to the priority and based on the number of incidents and their acuteness, the first place holds an access to land and related issues of disputed territories[25].

Table 11:Information about Population of Tajik enclaves[26]

Settlements	Population as of June 1, 2012			2000-06.06.2012		Areas under crops
	Total	Including:		Inflow	Outflow	
Shurab	3000	1600	1400	149	957	
Vorukh	28820	12307	12530	453	4304	345
AzonmakhTochikon	2202	1100	1102	75	460	16
Chorkukh	33373	16104	17270	288	160	373
KhodhzaA'lo	2983	1428	1554	137	261	126
Total	**70378**	**32539**	**33586**	**1102**	**6142**	

Official population size in Tajik enclaves within the region under review is 70378, whereas under the expert assessment it is up to 100 thousand. Population size of Tajik enclaves connected to "Vorukh-Shurab" WPR is 34005 and by 3 times exceeds the population in the Kyrgyz villages also connected to this Water Pipeline Route.

Areas under crops of the Tajik enclaves account for 860 ha[27], i.e. 0.013 ha per person. The amount of areas under crops in the village councils surveyed in Kyrgyzstan is 2462[28] and it is 0.101 ha per person. The amount of land per capita in Kyrgyzstan 7 times exceeds the number in Tajik enclaves. "Last year (2010–note by author) prices for land raised up to 500 thousand of Russian rubles per one hundred square meters in enclave; there is shortage of land. And here, it is just lying and is not cultivated"[29].

3.7. Attempts to Resolve Problems and DisputesRelated to "Vorukh-Shurab" Water Pipeline Route

3.7.1. Public Fund "For International Tolerance"

Attempts to settle problems and disputes related to joint use of "Vorukh-Shurab" WPR were undertaken by the Public Fund "For International Tolerance" (PFIT), which acts on the territory of Central Asia.PFIT was formally registered in April 1998. PFIT was initiated by employees of UNHCR Project implemented

[25]UNDPreport (Tajikistan) "PotentialforPeaceandThreatsofConflict: DevelopmentAnalysis of Cross-BorderCommunitiesofIsfaraDistrict of the Republic of Tajikistan (JaomatVorukh, Chorku0h, SurkhandShurab) andBatkenDistrict of Kyrgyzstan (Ak-Say, Ak-Tatyr and Samarkandek)",pages 8-9, July 2011
[26]Statistical data of Republic of Tajikistan
[27]Statistical data of Republic of Tajikistan
[28]DataofBatkenRayonStateAdministrationfor early 2012
[29]Internet-material: http://kabar.kg/index.php/analytics/full/19152

in 1996 under the UN Strategy for Prevention of Non-Violent Conflicts. PFTI's work is focused on two main directions:

1 - The prevention and non-violent resolution of interethnic conflicts in the Ferghana Valley; and
2 - The expansion of the space for dialogue and promotion of a culture of non-violence between civil society and power institutions in the Kyrgyz Republic.

PFIT initiated activity to regulate water-use issue. In order to start this activity, jurisdiction for the main facility of "Vorukh-Shurab" water pipeline, a body responsible for its operation and maintenance, should be identified, as well as the causes of water shortage. Since these issues could not be resolved without involvement of government bodies and specialists maintaining the pipeline, PFIT arranged a series of meetings with community leaders and local self-government bodies of cross-border territories. Upon results of these meetings the Initiative Group of community leaders and representatives of local self-government bodies was formed. The Initiative Group was to agree the number of water passages in villages supplied from "Vorukh-Shurab" WPR and identify responsible parties for further allocation of water resources. PFIT coordinated this activity.

In the course of monitoring by the Initiative Group 110 water passages were detected. Then, technical study was carried out and technical feasibility was drafted. The technical feasibility was approved by representatives of local self-government bodies at regular negotiations. In total, three interstate meetings were held with the state administration of Batken rayon of the KR and Isfara rayon of the RT. In the course of negotiations, the participants came to the decision that the number of water passages on the territory of Kyrgyzstan should be increased because of migration of ethnic Kyrgyz from the territory of Tajikistan. Further, the Initiative Group informed residents of Kyrgyzstan and Tajikistan at rural gatherings about the number of permitted water ways: in Uch-Dobo and Ak-Tatyr village - four water ways in each, seven water ways in Jany-Bak village, and four water ways in JamoatVorukh.

On December 9, 2001 during the third meeting the agreement on joint use of WPR "Vorukh-Shurab" was signed by four parties – state administrations of Batken rayon of the KR and Isfara rayon of RT, PFIT KR and NGO "Ittifok" RT. This Document regulates compliance with legal norms in water-use area and prevention of mutual claims to inter-district and interstate agreements.

On October 8, 2002 one more agreement was concluded regarding use of "Vorukh-Shurab" WPR. The subject matter of agreement was to secure responsibilities of the parties on efficient operation of "Vorukh-Shurab" WPR. The responsibility was assigned to the Public Utilities Services of Shurab City on the sections of route in Tajikistan and to "Angiden-Suu" Public Association of Water Users (PAWU).on the sections of route in Kyrgyzstan.

Followingthe activities undertaken within several years in cross-border villages of Kyrgyzstan and Tajikistan, conflicts related to "Vorukh-Shurab" WPR were reduced to the minimum. 91 illegal hookups were eliminated, which formerly led to uncontrolled and non-targeted water withdrawal from "Vorukh-Shurab"WPR.

Joint Kyrgyz-Tajik Committee performed inspection of water route "Vorukh-Shurab". As of November 13, 2001, 110 hookups to "Vorukh-Shurab"WPR were found out, of them only15 hookups were agreed.

In 2003 one more inspection of "Vorukh-Shurab" WPR was done by employees of Hukumat and Public Utilities of Shurab City, PF "For International Tolerance" and "Andigen-Suu" PAWU. The unauthorized hookups were again detected in Jany-Bak village and the dispute was settled between neighbors Mr. Dubanaev Gapar and ten families of Ak-Tatyr village council. Mr. Dubanaev G. installed a tap in his house and did not allow neighbors to use water. This point was permitted and designed for public use. Consensus was reached upon the inspection performed.

3.7.2. "Andigen-Suu" Public Association of Water Users

"Andigen-Suu" Public Association of Water Users was established by reorganization of the Water Committee. Such decision was made because, at that time, non-governmental organizations had wide opportunities to attract grant funds of donor organizations for construction and repair of water facilities, mobilize population and establish partnership relations with government institutions. From the date of

establishing the PAWU cooperated with the Center for Civil Society Support, Public Fund "For International Tolerance". PAWU members took part in a series of different trainings on project development, financial reporting, the basics of conflictology, negotiations and mediation.

PAWU implemented several technical projects: (1) construction of water pipeline in villages Uch-Dobo and Kerme-Too of Samarkandekskyi village council with the support of Swiss Cooperation and Development Agency, (2) Project "Water is a guarantee of friendship and peaceful co-existence" with the support of Counterpart Consortium, (3) USAID Project on decrease of ethnic tension in cross-border territories of the KR and the RT caused by lack of water resources.

PAWU was included into the Kyrgyz-Tajik Committee on Resolution of Issue of Transboundary "Vorukh-Shurab"WPR. PAWU took part in the joint inspection of "Vorukh-Shurab" WPR and served as the third party in negotiations on equal utilization of drinking water between the leadership of Isfara rayon of the RT and Batken rayon of the KR.

PAWU is an organization responsible for the section of route "Vorukh-Shurab" on the Kyrgyz territory. PAWU has an office, office equipment, furniture, and performs record-keeping. In 2001 there were 389 members in the organization. In 2005 9125 people from Ak-Tatyr, Samarkandek and Ak-Say village councils used the organization's services. Until recently, PAWU operated "Vorukh-Shurab" Water Supply System (WSS) and "Andigen-Suu" WSS. PAWU collected cash from the population, social enterprises and commercial units. The fee was according to the tariff rate. Fee for one citizen is 5 KGS per month regardless of whether he/she uses public stand-pipe or stand-pipe in a yard. Schools, kindergartens pay KGS 1800 per year. Chaihana (tea-house) pays out KGS 2000 per year. The money collected was used for current repair of WSS and staff salary.

Today, control and management of "Andigen-Suu" WSS and portion of "Vorukh-Shurab" is performed by Rural Public Association of Drinking Water Users (RPADWU). Public Associations were created under each AyilOkmotu. Such reorganization led to worsened WSS maintenance.

3.7.3. "Andigen-Suu" Water Pipeline Route

In the end of 90ies of the last centuryestablishment of Water Committees in the south of the country had started. They took an initiative to manage and maintain WSS. They were usually formed from the former employees who maintained WSS and public representatives. Construction of "Andigen-Suu" WPR has started in 1985. In 1987 36 km of trunk route was laid down. Collapse of the Soviet Union made this construction site as the delayed construction project. No distribution grid was built, no one maintained it for the past 10 years. In 2003 the Water Committee inspected the intake heading. Later, with the support of Red Cross the trunk line was extended to Samarkandek village. The water intake facility on 250 cubic meters was built at the joint of water intake from WPR "Vorukh-Shurab" with trunk water passage "Andigen-Suu". Water from two water passages was united and distributed in Samarkandek village and its areas. In the united system 70% of water volume is water from "Vorukh-Shurab" and 30% from Andigen-Suu. Today, the length of water pipeline is 43 km.

Water debit in "Andigen-Suu" WSS is 35 l/sec. Water source is the spring. Under expert's appraisal water in the spring is not sufficient to supply population of villages of Ak-Tatyr and Samarkandek. This fact was confirmed by heads of village councils as well. Water amount in WSS is currently not sufficient as the spring source is not regular and strongly depends on weather and climate conditions. In 2010 there was nearly no water in Andigen-Suu. Since the population size increases the Kyrgyz villages may not do without "Vorukh-Shurab" WPR.

Under ADB Project "Building Infrastructure Services at the Settlements Level" technical documentation was developed to rehabilitate "Andigen-Suu" WSS, build distribution grids and connect to one more source – spring located at 5 km from the current spring. The population collected 5% cash contribution in the amount of KGS 4.0 million. The cash is yet on the bank account of Andigen-Suu WSS, which performed all works to collect 5% contribution.

Today, the project management was transferred to the Agency of Communities Development and Investments of the Kyrgyz Republic (ARIS). According to the latest information from ARIS, ADB suspended funding of those WSS for which only technical documentation was prepared and no construction works started. When talking with an expert, residents and representatives of local government bodies strongly emphasized that they cannot reject from using "Vorukh-Shurab" WPR. Among the reasons they stressed the fact that there is more water in "Vorukh-Shurab" WSS than in "Andigen-Suu" and they do not have much hope for the source that supplies the latter WSS. They later added that "Vorukh-Shurab" WPR goes across the territory of Kyrgyzstan. Therefore, Tajikistan should pay rent for land under the water passage (pay for water transit).

3.7.4. Further Steps to Settle Disputes

Further, more efforts to regulate the issue of joint use of "Vorukh-Shurab" WPR were undertaken. Government bodies from Batken andIsfara rayon took part in this process. The round table was held with the topic "Water is Life Source"; Memorandum was signed and bilateral agreement on operational mode of WPR "Vorukh-Shurab" was concluded to ensure water supply to residents of Shurab City. However, decisions made were never implemented. Eventually, they will become more unmanageable.

In 2006-2007 water has started to be supplied from Isfara River to Shurab Cityvia Surh village (Tajikistan) with the use of pump. SinceShurab is located higher, the pump should work all the time. However, because of problems with electricity in Tajikistan, it became unprofitable to use pump. In 2010 with the help of UNDP Tajikistan, the pump was installed on "Vorukh-Shurab" WPR so that to pump water from the water pipeline. The water storage was built with capacity of 10 thousand cubic meters, from which water is supplied under gravity to Shurab. Pump is operated not all the time, but only when the storage should be filled in. Today, because of this water storage Shurab City residents get water in summer as well. In winter period, from September 15 to May 15, water is supplied to the city without pump. Nowadays, more than three thousand people live in Shurab[30].

Lately, Tajikistan has started raising an issue of laying down water pipeline from Surkh over the territory of Kyrgyzstan. Pipes were delivered, machinery brought, and trenches have been excavated. The Kyrgyz border guards had to interfere. They detained the machinery, as moratorium was declared to perform any construction works because of unsettled issue of demarcation of borders on disputed territories.

3.8. Key Findings on Social and Economic Section

The following *problems* are typical for the region under review:

1. *Water-use problems.* Communities of the Tajik enclaves, villages of village councils Ak-Sai, Ak-Terek and Samarkandek and bordering Tajik communities are connected by common waterways. In the process of joint water use, there are frequent disputes between residents of the Kyrgyz and Tajik communities regarding water distribution, namely, distribution of irrigation water from transboundary channels Mechnatabad/Ak-Sai, Machai/Ak-Tatyr, Paska-Aryk/Juinav; water use from transboundary channel Tort-Kul; water use from transit "Vorukh-Shurab"WPR.

2. *Problems of "disputed territories".* Lack of clearly defined border between Kyrgyzstan and Tajikistan leads to disputes on ownership of a land plot between neighboring Kyrgyz-Tajik communities, thus, resulting in open ethnic conflicts.

3. *Customs and border conflicts.* Because of geographic location, the village councils have no direct transport communication with the rest of Batken rayon, as all transport ways go along the territory of Tajikistan. Even four villages, which form one village council Ak-Sai, are divided by territories of the Republic of Tajikistan. It complicates free movement of residents and transport vehicles of both countries, which are to go through customs and border control. One of the

[30]Statistics data of Tajikistan.

consequences of territorial disputes is that the Parties place customs and border checkpoints on disputed areas, which are used for transboundary transport communication. In this regard, customs and border procedures raise discontent among residents that have to cross border every day.

4. *Problems of Movement.*Transboundary transport ways: Tajik motor road Isfara-Vorukhgoes across the territory of Ak-Sai village of the KR; Kyrgyz motor road Batken-Kok-Tash-Samarkandek (Batken rayon) – Isfana (Leilek rayon) crosses 170 km site of the Tajik territory; motor road Batken – Ak-Saigoes across the territory of Surkh and Chorkukh villages of Isfara rayon of the RT.

5. *Problems of Large-Scale Cutting of Forest Land and Archa (juniper) Forests.* There is large-scale cutting of forest land and archa forests on the Kyrgyz mountain areas by residents of cross-border Tajik communities.

6. *Problems of illegal use of pastures* by residents of cross-border Tajik communities.

Empirical research under OSCE Project "Sustainable Use and Management of Water Resources in the South of Kyrgyzstan" exposed the following:

1. "Vorukh-Shurab" WPR supplies water to nine villages of Kyrgyzstan: Kapchygay, Ak-Say, Tash-Tumshuk, Uch-Dobo of Ak-Say village council, villages Ak-Tatyr, Ortoboz of Ak-Tatyrvillage council, villages Jany-Bak, Samarkandek and Paska-Aryk of Samarkandekvillage council. Six villages are 100% supplied by water from the water pipeline route. Uch-Dobo is supplied by 40%, Ak-Tatyr – by 50%, and Samarkandek – by 70%. There are 67 public stand-pipes in all villages. Water use for irrigation is performed in Jany-Bak village only for irrigation of household plots, vegetable gardens and orchards.

2. "Vorukh-Shurab" WPR fully supplies two villages of Tajikistan – Hodja-Ailo and Shurab City. It was not possible to get data about the number of public stand-pipes and water use for irrigation in Tajik villages.

3. As a result of the research, it has been found out that according to inspection held in 2001 by the Joint Kyrgyz-Tajik Committee, the total number of hookups to water pipeline route "Vorukh-Shurab" of villages of Kyrgyzstan and Tajikistan was 110, including only 15 authorized. 42 hookups were on the territory of Kyrgyzstan, including only 10 authorized. 68 hookups were on the territory of Tajikistan, including 5 authorized. Therefore, 62% of hookups were made in the Tajik enclaves and only 38% in the Kyrgyz villages. The diameter of pipes of connected hookups varied from 10mm to 159 mm. Diameter of connected pipes in Kyrgyzstan was from 10 to 40 mm, and 50% of them – 25 mm in diameter. In Tajikistan pipes' diameter was from 15 to 159 mm and 60% of them – pipes of 32-159 mm in diameter.

4. In 2010, following the actions of NGOs, rural activists, rayon local government bodies of Kyrgyzstan and Tajikistan, the bilateral agreement on operational mode of "Vorukh-Shurab" WPR was signed in order to ensure water supply for Shurab citizens.

5. Today, there are 24 authorized hookups to "Vorukh-Shurab" WPR on the territory of Kyrgyzstan and 56 unauthorized. It was not made possible to determine the number of hookups on the territory of Tajik enclaves in the course of the Research.

6. This region is featured by high population density in Tajik enclaves. Population density is so high that they are simply "pushed out" from their territory. Enclave population exceeds population of the Kyrgyz settlements by four times and more.

7. Lack of proper regulation of issues related to joint use of "Vorukh-Shurab" WPR by the Tajik and the Kyrgyz community gradually form a conflictogenic factor. Many political scientists[31] and experts tend to believe that this region could be the next seat of a conflict and, most likely, will be an ethnic conflict regardless of true reasons. "Vorukh-Shurab" WPR, which was the source of conflicts several times, is the indicator of fight for natural resources – land, water, pastures, and forest land.

8. Fight for natural resources is aggravated by issues between two countries, which have not been settled over long time – demarcation and delimitation of borders, disputed territories, problems of transboundary roads, borer checkpoints, etc. against the background of intensified reactionary Islamization. The conflictogenic factors cause increased ethnic intolerance.

9. The Research showed that drinking water issue is not pressing for the most part of population of villages connected to "Vorukh-Shurab" WPR, except for certain sections of expanded villages. Water issue was moved into the policy area, became the leverage, and the way for dispute resolution. There is an intended shift of focus, when the issue of water supply from "Vorukh-Shurab" WPR is confused with other sources of water supply for drinking and irrigation needs.

10. "Andigen-Suu" WPR has the debit of water of 35-45 liters per second. The water source is the spring. For regular water supply under ADB project it was anticipated to connect one more spring at the 5 km distance from the old one. However, in the course of the Research we were informed that this project was suspended by ADB.

11. Local self-government bodies, residents of the Kyrgyz villages mentioned during the survey that they prefer to use water from "Vorukh-Shurab" WPR, as there is more water in it than in water pipeline Andigen-Suu. One more argument for "Vorukh-Shurab" WPR was mentioned. As Isfarinka River originates in mountains of Kyrgyzstan and runs across the territory of Kyrgyzstan, the Kyrgyz settlements have the right to use this water pipeline route.

[31] PFIT data.

4. Analysis of Legal Framework

Following the Terms of Reference of OSCE Project the objective of this Chapter shall be to analyze the legal framework and the institutional structure in two countries, having the final objective to provide justification and determine the operation mode of "Vorukh-Shurab"WPR based on current international treaties on water relationships between the Kyrgyz Republic and the Republic of Tajikistan. Another task was to develop proposals for payment for water transit fee over the territory of Kyrgyzstan with "Vorukh-Shurab" WPR in operation, on the basis of the legal framework analysis performed.

4.1. Provisions for Regulation of Water Relationships during USSR period

When two republics were a part of one state, all issues of diverse aspects of cooperation were settled according to provisions of the Fundamentals of Water and Land Union Legislation with due account of existing provisions in legislations of the republics. In particular, these aspects related to the issues of use of water and land resources, and other issues of natural resources use in the country. Meanwhile, it is worth to mention that such issues were settled with due regard of the interests of the Union state. Regarding use of water resources based on the principle of limitation of water distribution, the following can be stated.

The limits of water resources distribution, which existed until now between the Central Asian Region countries, were developed in 1975-1980s on the basis of "Schemes of Complex Use and Protection of Water Resources" elaborated for all water basins. As the basis for assessment of potential water reserves the estimated river flow of 90% of supply was used, taking into account underground and return water. Distribution of water resources, first of all, rested upon the principle of equal water supply for existing irrigated lands with regard to water supply for economic and household needs, according to population size. The water resources distribution limits for four countries of the region were estimated based on the existing land fund, given prospective development and science-based regimes for agricultural crops irrigation. The water share (quota) due to each country was established as a percentage of estimated reserves and the volume of water distribution was regularly adjusted depending on the actual level of water supply.

In 1980-83 the USSR Ministry of Water Resources approved water consumption limits for five countries of the region. These limits are still followed by these countries:

- "Regulation on Division of Flow in Basin of Chu River" approved by the USSR Ministry of Water Resources on February 24, 1983;
- "Regulation on Division of Flow of Talas River" approved by the USSR Ministry of Water Resources on January 31, 1983;
- Adjusting Note "Specifying the Scheme of Complex Use and Protection of Water Resources of Syrdarya River Basin" approved by the USSR Ministry of Water Resources on February 29, 1984.
- Protocol on Inter-republican Distribution of Flow of Small Rivers in Ferghana Valley approved by the USSR Ministry of Water Resources on April 11, 1980.

In February 1992 the heads of water resources entities of five CAR countries reached an agreement that water distribution "should be based upon existing water consumption", that is they retained the earlier approved quota for water distribution. This decision was confirmed by the Heads of the government at Summit in Nukus in September 1995 and Kyzyl-Orda City in April 1996, with the reservation "until approval of the regional water strategy".

Regarding water relationships of two countries, the above stated approved regulation by the USSR Ministry of Water Resources was applied in the part related to the Scheme of Complex Use and Protection of Water Resources of Syrdyrya River Basin and, in particular, the Protocols on Water Division of Flow of Small Rivers of Ferghana Valley at the local level. Such protocols are concluded on bilateral basis by representatives of water resources entities of two republics since 60-s of the last century

and were reviewed in light of changed circumstances. Because of specific importance of water in the life activity of local population and certain unsettled issues in our region, such protocols were approved at the level of the USSR ministry. Enforcement of provisions of the said Protocol in USSR times was supervised at the local, republican levels, as well as at the level of the Union's agency.

Pursuant to the above mentioned Protocol of USSR MLDWR dated April 11, 1980, every calendar year water resources organizations of neighboring oblasts establish estimated distribution of water resources for each decade during vegetation period, for each river considering an expected hydrology of the year. Distribution of water resources dealt with all types of water use consistent with river flow losses, losses on irrigation channels, water withdrawal for public and industrial needs, water regulation in water reservoirs, and water utilization plans.

With respect to the Research topic of OSCE Project, as long as "Vorukh-Shurab" WPR takes water from Isfara River feeder, it should be mentioned that water division between the Republics of Kyrgyzstan, Tajikistan and Uzbekistan under the said Protocol on Isfara River was established in the ratio 37:55:8 (in % accordingly).

Water division issues between the Republics were considered both on the basis of regular bilateral meetings of water resources agencies and participation of representatives of ministries and agencies of the Union level. It is noteworthy that on May 16, 1991 the joint session of representatives of Union agencies and republican ministries regarding Isfara River water division issues was conducted upon special instruction by the Council of Nationalities of the USSR Supreme Soviet of the USSR.

Such instructions by the USSR government bodies resulted from conflict situations in Isfara River basin related to water and land use. One of the well-known conflicts is clashes between Tajiks of Isfara rayon of Tajikistan and the Kyrgyz people of Batken rayon of Kyrgyzstan. Clashes of this kind did not begin in 1989, as mass media reported, but well before that (it was known about events in settlements Vorukh-Tangi in 1982 and Match (October) – Ak-Tatyr in 1988). Beyond any doubt, it demonstrates that the source of ethnic contradictions were not momentary factors, but longstanding objective factors. These factors were mainly not reflected in the public conscience for a long time and were ignored by the authorities of those times.

The reasons for such conflicts were as follows:

- extremely high growth of population living in the region: for example population of Vorukh enclave in 1990 increased more than by 20 times, in Isfara – more than by 23 times, etc. It is perfectly clear that no social infrastructure was able to deal with such increase, not to mention traditional agricultural infrastructure, and
- over the relatively short period of history under the Union state significant movements of large population groups took place; land was redistributed and, accordingly, the rights for land and water. Common law system that regulated water and land relationships was changed in 70-80s of the 20th century by adoption of the above stated Protocols, while the conflict capacity was laid down by the water division principle. Following this principle water supply level for existing irrigated land was within 70% in normal hydrology year, not to mention a threat of emergence of conflict in low hydrology years.

4.2. Regulation of Water Relationships in Sovereign Period

Brand new nature of relationships between the Republic of Tajikistan and the Kyrgyz Republic were formed after getting political independence by the countries. Owing to historical traditional friendly and mutual beneficial relations, Tajikistan and Kyrgyzstan have always paid and continue to pay considerable attention to expansion and deepening of a wide range of bilateral cooperation, which is facilitated by presence of geographic, geo-economic, cultural and other factors uniting the interests of two countries. The results of official visits, meetings and negotiations at the top level and other levels always confirm proximity and similarity of positions of two countries on issues of regional security, economic cooperation, water and energy policy, and strengthening of cross-border relationships. They also identify the main shapes of cooperation; specify priority areas on major aspects of interstate relationships. This is proved by an intention of two countries to expand and deepen versatile and bilateral relations, which was

reflected in Memorandum on Creation of Interstate Coordinating Council and the Council of Ministers of Foreign Affairs of the Republic of Tajikistan and the Kyrgyz Republic signed by the heads of two countries on May 16, 2008 in Sughd oblast of the Republic of Tajikistan.

Legal tools for interstate partnership, interaction and coordination, expansion and deepening of bilateral cooperation rest upon over 70 interstate, intergovernmental and interagency treaties covering diverse activities. Treaties were concluded form the day of establishment of diplomatic relationships between Kyrgyzstan and Tajikistan on January 14, 1993. The following international agreements have crucial role in development and strengthening of bilateral relations:

- Agreement on the Fundamentals of Interstate Relationships between the Kyrgyz Republic and the Republic of Tajikistan (1996);
- Protocol on Creation of Intergovernmental Committee on Complex Review of Bilateral Issues (1996);
- Agreement between the Kyrgyz Republic and the Republic of Tajikistan on Good Neighborly and Partnership Relations (2004);
- Joint Statement by Presidents of Two Countries on Further More Intensive Friendly Relationships between the Kyrgyz Republic and the Republic of Tajikistan (2007);
- Memorandum on Creation of Interstate Coordinating Council of the Kyrgyz Republic and the Republic of Tajikistan and the Council of Ministers of Foreign Affairs of the Kyrgyz Republic and the Republic of Tajikistan (2008);
- Program of Cooperation between the KR Ministry of Foreign Affairs and the RTMinistry of Foreign Affairs for 2009-2010.

Multidimensional cooperation acquired more precise benchmarks because of creation of Tajik-Kyrgyz Intergovernmental Committee on Complex Review of Bilateral Issues. The Committee was established on November 5, 1997 and held 11 sessions. Bilateral cooperation issues in the area of trade, business, industry, energy, water resources and land development, transport, education, emergencies, labor migration and cross-border cooperation were considered at these sessions. Interagency Working Group on review of bilateral issues of water resources use between Kyrgyzstan and Tajikistan established under joint Order by the Ministry of Water Resources and Land Development of Tajikistan and Department of Water Resources of the MALD of Kyrgyzstan serves as a subcommittee.

4.2.1. Conventions and Agreement to which Kyrgyzstan and Tajikistan are Parties under CIS and Central Asian Region framework

Under the Commonwealth of Independent States (CIS) the Agreement on Cross-Border Cooperation in the Area of Exploration, Development and Protection of Subsoil (dated May 31, 2001) was adopted and signed by the Republic of Belarus, the Kyrgyz Republic, the Republic of Moldova, the Russian Federation, the Republic of Tajikistan and Ukraine. The Agreement was effectuated for Belarus (on October 1, 2001), *Kyrgyzstan* (October 4, 2001), Russia (October 4, 2001), and *Tajikistan* (January 21, 2002). The Agreement is designed for elaboration and formation of the legal framework in issues of cross-border cooperation in the areas of exploration and development of natural resources deposits, and solution of environmental issues. Implementation of this Agreement will facilitate formation and development of mineral resources and derived products, mutually beneficial development of fuel and energy and primary resources deposits, development of environmental monitoring of geological setting of cross-border regions at the interstate level.

The first interstate treaty on interregional and cross-border cooperation is the Agreement on Friendship and Cooperation between Osh Oblast of the Kyrgyz Republic and Leninabad Oblast of the Republic of Tajikistan (dated March 30, 1994) (rayons of current Batken oblast were a part of Osh oblast at that time).

After creation of Batken Oblast in April 2004 the Agreement on Friendship and Mutually Beneficial Cooperation was concluded between Batken Oblast of the Kyrgyz Republic and Soghd Oblast of the Republic of Tajikistan.

The basis for interstate regulatory framework of regional and innovative cooperation in CIS is the Concept of Interregional and Cross-Border Cooperation of country-members of the Commonwealth of Independent States approved by Decision of the Council of Heads of CIS Governments dated September 15, 2004, and Convention on Cross-Border Cooperation of CIS participating states adopted by Decision of the Council of Heads of CIS Governments on October 10, 2008.

An underlying regulatory act, which defines the legal area for cross-border cooperation of CIS participating states is Convention on Cross-Border Cooperation of CIS Participating States (Convention) adopted by the Council of CIS Heads of governments on October 10, 2008. The Convention was signed by the Republic of Armenia, the Republic of Belarus, the Republic of Kazakhstan, *the Kyrgyz Republic*, the Russian Federation, and *the Republic of Tajikistan*. The Convention was effectuated for Belarus (on June 22, 2009), Kazakhstan (on March 19, 2010), Russia (on June 22, 2009), and *Tajikistan(on June 22, 2009).The Kyrgyz Republic ratified the Convention by the KR's Law #187 dated June 25, 2009.*

The Convention is a program document describing the key principles and activities to develop cross-border cooperation designed to be become a tool for involvement of all levels of authorities into solution of cross-border cooperation issues. Cross-border cooperation is a sustainable and evolving system of interconnections between neighboring countries based on uniform principles and emerging under coordinated strategy pursuant to international agreements in the area of cross-border cooperation of CIS participating states.

The principal mechanisms of cooperation of cross-border territories are development of cross-border trade, economic zones, creation of cross-border cooperation management bodies, conclusion of interregional cross-border cooperation agreements, improvement of budget and other tools of regional policy on development of cross-border cooperation, coordination of specific tax, budget, customs, border and other actions ensuring differentiated priority of cross-border territories development.

Pursuant to Article 3 of the Convention cross-border cooperation is performed principally on the basis of agreements between competent bodies concluded within their competence in compliance with the legislation of the Convention's participating states and international law. These agreements are listed in the Register (list) of signed international documents on interregional and cross-border cooperation of CIS participating countries[32]. Bilateral cross-border cooperation and partnership agreements are concluded between oblast, city, and rayon executive committees of neighboring territories.

Under Article 4 of the Convention draft model agreements on organization of cross-border cooperation are being prepared.

When drafting the Convention the model agreements on organization of cross-border cooperation were attached as appendices.

The position of the Republic of Tajikistan regarding regulation of water and energy relationships with neighboring countries was declared at many international and regional forums and meetings, and was as follows. The Republic of Tajikistan in interaction with neighboring countries in the area of rational use of water and energy resources shall be guided by regional and interstate agreements, decisions of the Council of CIS Heads of governments, and declaration on use of water resources of transboundary rivers, including:

Agreement between the Republic of Kazakhstan, the Republic of Kyrgyzstan, the Republic of Tajikistan, the Republic of Turkmenistan and the Republic of Uzbekistan on Cooperation in the area of Joint Management, Use and Protection of Water Resources of Interstate Sources,dated February 18, 1992, Almaty City. Under this Agreement, the Interstate Coordinating Water Committee (ICWC) with executive bodies of BWO "Amudarya" and BWO "Syrdarya", ICWC Scientific and Information Center (location – Uzbekistan, branches in ICWC member-countries), and ICWC Secretariat (location - Tajikistan, Hudjent City) were established;

Agreement on Joint Actions to Solve Crisis of the Aral Sea and Sub Aral area, Improve Environment and Promote Social and Economic Development in the Region (dated March 26, 1993, Kzyl-Orda City). In accordance with this Agreement the heads of Central Asian region countries made decision to create the International Fund for Saving the Aral Sea;

[32]www.cis.minsk.by

Nukus Declaration of Central Asia countries and international organizations on the sustainable development of the Aral Sea Basin (dated September 20, 1995, Nukus City). This document confirms adoption of previously signed and existing agreements, treaties and other regulatory acts to regulate water resources relationships in the Aral Sea basin between the region's countries;

Agreement between the Government of the Republic of Kazakhstan, the Government of the Kyrgyz Republic, and the Government of the Republic of Uzbekistan on use of water and energy resources of Syrdarya River (dated March 17, 1998). Tajikistan joined this Agreement later.

Agreement between the Government of the Republic of Kazakhstan, the Government of the Kyrgyz Republic, the Government of the Republic of Tajikistan and the Government of the Republic of Uzbekistan on Cooperation in the Area of Hydro Metrology (1999);

Agreement on Parallel Operation of Power Systems of Central Asia (1999);

Regulation on International Fund for Saving the Aral Sea and *Agreement* on Status of the International Fund for Saving the Aral Sea and its organizations(dated April 9, 1999, Ashhabad).

4.2.2. Bilateral Treaties and Agreements

Joint Statement (Memorandum) by Presidents of Kyrgyzstan and Tajikistan

During working visit of the President of Kyrgyzstan and Tajikistan upon the results of the meeting both Presidents signed Memorandum (Joint Statement) of two presidents dated May 16, 2008 in Khudjand City (Sogd oblast of Tajikistan).

Pursuant to documents signed the Parties in Article 1 founded the Interstate Coordinating Council and the Council of Ministers of Foreign Affairs of the Kyrgyz Republic and the Republic of Tajikistan. Having marked the need and an importance to accelerate work of the Intergovernmental Committee on Delimitation and Demarcation of the State Borders, the Presidents assigned the governments of their countries to reach an agreement and sign Intergovernmental Agreement on Prohibition of Economic Activity along the State Border Line Prior to Completion of its Delimitation and Demarcation. It was envisaged to form joint administrative groups of cross-border rayons for operative solution of emerging issues of problem nature, if necessary.

To implement the decision of the leadership of two countries, the Kyrgyz-Tajik Intergovernmental Committee assigned local government bodies of both countries to prohibit all types of construction on the border sections prior to completion of delimitation and demarcation of the state borders of Kyrgyzstan and Tajikistan. This decision was made at the 9th session of the Intergovernmental Committee on Complex Review of Bilateral Issues held on December 24-25 2009, in Osh, Kyrgyzstan.

Regarding OSCE Project this decision contains the prohibition to build new water pipeline or its section upon resolving of border setting issues. However, possible adoption of the special agreed decision by two countries on this specific issue is not completely excluded. The process of making such decision may be dragged out.

Issues of Mutual Recognition of Rights and Regulation of Ownership Relationships

According to Article 13 of the Agreement on Mutual Recognition of Rights and Regulation of Ownership Relationships (dated October 9, 1992) ratified by Resolution of the KR Jogorku Kenesh of January 12, 1994 #1404-XII, activity of enterprises, institutions, organizations and other facilities located on the territory of the Kyrgyz Republic and which were under control of government bodies of other Union republics of the USSR as of December 1, 1990 and are in ownership by other legal entities and individuals, which under Article 2 of this Agreement are recognized as property of another Party, shall be regulated by the laws of the Party on the territory of which they are located, unless otherwise stipulated by other agreements of the Parties.

Territorial units of the State Property Fund of the Kyrgyz Republic under Article 12 of the above stated Agreement jointly with bodies of another Party authorized to dispose of the state property were to establish by protocols the legal status of previously formed enterprises recognized under this Agreement

as a property of another Party and located on the territory of the Kyrgyz Republic. The same procedure was applied for the legal status of assets of the Kyrgyz Republic located on the territory of another Party.

Note: This is related to those facilities for construction of which land plots were allocated by respective decision of local government bodies and exclude facilities listed in Resolution No. 66 of the Government of the Kyrgyz Republic (dated February 7, 2000).

Options of decision may be different: whether sale/purchase, exchange, transfer to collateral, rent, gratuitous transfer or on a contractual basis of this property to another Party, in the form of a joint enterprise or a foreign enterprise in accordance with existing legislation of the location. The Protocol was also to specify that from the moment of enforcement of this Agreement or from the moment of signing of Protocol on Agreement of Parties they should be registered by appropriate bodies per se, and bear fiscal obligations according to the location.

According to Article 10 of the Declaration on State Sovereignty of the Republic of Kyrgyzstan (dated December 15, 1990), enterprises, institutions, organizations and facilities of other countries and their residents, international organizations may be located on the territory of the Republic and use natural resources of Kyrgyzstan under its laws. Article 3 of the named Agreement regulate ownership rights for land and other natural resources by the legislation of the Parties on the territory of which the property items are located, unless otherwise is stipulated by other agreements of the Parties. Therefore, local tax bodies should produce the requirement to pay taxes for land use pursuant to acting rates for each period, starting from the moment of getting independence.

If other Party rejects from the joint determination of the legal status of facilities located on the territories of countries, than the facilities, for allotment of land of which appropriate documents exist, shall be considered as foreign legal entities under the current legislation of the Kyrgyz Republic from the moment of getting independence.

With respect to "Vorukh-Shurab" WPR the provisions of this Agreement prescribed to enforce actions stated above, but they were not executed by the agencies concerned of the countries. The ownership matters or other solution was not considered by respective agencies and was no submitted for review by the bilateral Kyrgyz-Tajik Intergovernmental Committee, which had the right to make specific decisions. In this regard, certain efforts were undertaken at the local level for partial resolution of issues of maintenance and repair of water passage (treaties and agreements between local bodies for water passage operation will be described further).

The issues of ownership and property could not be resolved because of poor competence of local bodies to settle issues of such level.

Norms of Regulatory Acts of Kyrgyzstan Regulating Interstate Water Relationships

Key regulatory acts for interstate water relations are the Constitution and the Law of the KR "On Interstate Use of Water Assets, Water Resources and Water Facilities of the Kyrgyz Republic" dated July 23, 2001. The principles of international cooperation in the area of environmental protection, including water resources, are regulated by Article 57 of the Law "On Environmental Protection". In the process of drafting agreements and treaties and their ratification, provisions of the Law "On International Treaties of the KR" should be taken into account. The Constitution and laws mentioned confirm in their provisions the priority of norms of ratified international treaties of the KR, which become the element of legislation of Kyrgyzstan under this condition, over the provisions of the national legislation of the country.

The Kyrgyz Republic in the process of implementing the state policy on use of water resources of rivers formed on the territory of the Kyrgyz Republic and flowing beyond its borders, and conduct of interstate negotiations on water issues, proceeds from the following principles and provisions:

- Recognition of property right of the state for water bodies, water resources and water facilities within its territorial borders;
- Acknowledgement of water as a type of natural resources having its economic value of all competing types of its use and being a good;
- Paid water use in interstate water relations;

- Interstate use of water resources of the Kyrgyz Republic is performed based on two or more agreements and treaties concluded by the parties concerned and ratified pursuant to the legislative provisions of the contracting parties;
- Achievement of mutual economic benefit on equal and reasonable basis in use of water resources of the Kyrgyz Republic is stipulated by intestate agreements and treaties;
- Solution of issue of supply of river waters, payment for water use and distribution of profit on use of water reservoirs and other irrigation structures of the Kyrgyz Republic by other countries is stipulated by intestate agreements and treaties;
- Establishment of procedure and amount for mutual settlement in the process of interstate paid use of water resources of the Kyrgyz Republic based on normatives coordinated by the parties, taking into account world prices and consumer demand for water resources;
- The right of the Kyrgyz Republic performing flow regulation of its rivers and supply of water to countries-water users for cost-sharing reimbursement by neighboring countries-water users of expenses and damage incurred for construction, reconstruction and operation of water facilities of interstate significance;
- Relationships with foreign partners at market-based implementation of interstate water resources agreements and projects;
- Cooperation of the Kyrgyz Republic with neighboring and other countries concerned in the process of development, investing, and shared implementation of programs and projects on preservation, protection, development and complex use of water resources, water bodies and adjacent lands;
- Cooperation with foreign partners in the course of development and introduction of technical means and technologies ensuring economic use of water resources;
- Shared implementation with foreign partners of coordination and investments into scientific and research, design and engineering and technological works on creation and introduction of means of mechanization, automation, computer engineering, equipment and devices for equipping and technical reequipping of water systems, facilities and installations on a mutual beneficial basis.

Article 4 of the KR Law "On Interstate Use of Water Bodies, Water Resources and Water Facilities of the Kyrgyz Republic" clearly states with respect to interstate bodies for water relationships regulation that "…The joint interstate committees may be established upon mutual consent by the Parties in order to elaborate proposals on planning, investing, and coordination of interstate joint agreements, programs, and projects in the area of water relationships".

Following the provisions of above mentioned regulatory acts and in view of provisions of other acts, such as, declarations and statements by the heads of states and governments, adopted national programs and concepts, draft strategies, and other documents, there are certain grounds for the statement below.

The Kyrgyz Republic shall develop international water relationships by:

- Conclusion of multilateral or bilateral treaties regulating legal, organizational, technical, economic and other aspects of water relationships between the countries concerned;
- Active involvement in the interstate programs related to water issues;
- Rendering support to consideration of direct international relations between ministries, agencies, cross-border municipalities and legal entities of the Kyrgyz Republic with foreign partners on water issues when performing the state supervision over compliance with norms of international water law and domestic legislation;
- Active involvement of authorized representatives of ministries and agencies concerned in the work of the permanent Interstate Coordinating Water Committee (ICWC), combined working groups and other permanent or temporary interstate structures envisaged by conditions of interstate treaties and agreements. From the legal viewpoint, the results of activities of the structures mentioned serve as guidelines and become effective only upon ratification of agreements reached according to the procedure established by the legislation of all countries – participants of agreements;

- Provision of the most-favorable treatment for attraction of foreign investments, donor aid, grants and privileged credits for implementation of programs and specific projects aimed at improvement of efficient use and protection of water resources fund.

In the process of elaboration of interstate treaties and agreements on water issues a balanced approach should be employed. This approach should be aimed at protection of national interests of the Kyrgyz Republic and achievement of mutually acceptable solutions for all participating parties. To maintain trust-based relations with neighboring countries, the state admits a possibility of certain compromises in negotiation process, except for cases connected with the sovereignty, national security and territorial integrity of the country.

When formulating and implementing the long-term external water policy, the Kyrgyz Republic will adhere to the following fundamental principles:

- Recognition of historical community of nations of the Kyrgyz Republic and neighboring countries;
- Principle of "voluntary limited sovereignty" stipulating unconditional retention of property rights of each state for water bodies and water resources within the territorial borders, but with due regard of the rights and interests of other countries;
- philosophy of "community of interests" that stipulates ensuring mutual benefit from the complex use of water resources fund and ensuring rights of each of the parties concerned for use of the certain portion of water resources within the agreed quota;
- principle of inviolability of territory, which envisages mutual rejection from unauthorized interference into use of water resources fund of other countries;
- mutual responsibility for preservation of water bodies and water resources as elements of global ecosphere;
- mutual responsibility for inflicted damage and repayment of loss impaired to other countries, their population, and economic entities;
- extension of the principle of paid water use to international water relationships;
- rights of each country for protection of its social, economic and other interests;
- rights of each state and its economic entities for cost compensation related to performance of works and provision of services for the benefit of another country, its population or economic entities;
- development of free market relations with foreign partners or implementation of joint water resources agreements and projects, but ensuring the regular state control over their implementation within the current legislation of the Kyrgyz Republic;
- Striving for regulation of any disputes or conflict situations in the course of implementation of water relations by negotiations only. If water disputes may not be settled on the basis of bilateral contacts, the international law procedures should be applied. For example, arbitrators from international organizations or non-concerned countries should be attracted; mutual complaints and claims should be reviewed by competent bodies, etc.
- Striving for ensuring equality of rights and long-term interests of all participating countries. Meanwhile, the thesis of "equality of rights" should not automatically provide for equality of quota of water consumption for each country.

The Kyrgyz Republic is intended to support and develop cooperation with other countries on a mutual beneficial basis in the following key areas:

- Development, coordination, investing, and implementation of programs and projects of complex use of water bodies and water resources;
- Planning, investing, and undertaking actions to protect water resources fund from pollution and exhaustion;
- Planning, investing and implementation of actions to develop irrigated farming, hydro power, fishery, forestry, hunting and public utilities sectors and other water consuming economic sectors;
- Regulation of river flows, prevention and mitigation of consequences of harmful impact of water, including flood-control, erosion-preventive and forest-protection works;

- Mutual warning and rendering mutual aid in case of emergencies, natural disasters, low hydrology and other emergencies on water bodies;
- Joint development and setting up of adoption of water saving and water protection technologies, devices, equipment, machinery used in water industry;
- Development, coordination, investing and implementation of projects on construction of new, upgrade, technical re-equipment, automation and telemetry of existing water industry complexes utilized for the needs of the parties concerned;
- Joint performance of research and development, design and survey and technological works aimed at improvement of efficient use of water resources;
- Sharing of information about condition and use of water resources, which are of mutual interest;
- Development and realization of the procedure for regular observations at points of interstate water distribution;
- Coordination of actions on monitoring of water resources and safety of water industry structures;
- Coordination and mutual recognition of standards, norms, rules and legal aspects in the area of use and protection of water resources fund;
- Joint implementation of regional complex programs, which are of mutual interest;
- Joint development and implementation of procedures for prevention and regulation of cross-border water disputes, protection of water rights of population and economic entities of the countries concerned;
- Coordination of actions to support business activity, attract foreign financial and labor resources, machinery, materials and equipment to implement joint water industry projects;
- Joint implementation of actions to develop legal framework for interstate water relations, coordination of customs, tax policies, and other aspects of the national legislations of the countries concerned, which have a direct or indirect impact on water relations.

The Kyrgyz Republic recognizes the following as the area of common interests that needs coordinated actions with neighboring countries:

- regimes of functioning of water industry systems and structures having a direct or indirect impact on social or economic conditions of other countries; norms and schedules of domestic water consumption having an effect on compliance with agreed quota of water resources use;
- Discharge of contaminants into water bodies and water industry systems and other negative man-caused phenomenon having an impact on water resources or ecosphere of other countries;
- Procedures of mutual control over compliance with commitments stipulated by interstate agreements and treaties;
- regimes of shared operation of water industry systems or water consuming enterprises on cross-border territories within the programs and business projects envisaged by interstate agreements and treaties;
- conditions for performance of any type of works on cross-border water bodies and water resource lands;
- procedures for operative adjustment of conditions of interstate water distribution in critical periods of shortage of water resources;

Water-related and other legislation of the Kyrgyz Republic allows establishing joint enterprises, open joint stock companies and other business structures with foreign capital and foreign legal entities, which are engaged into water industry activity. It is permitted to give water bodies or their sites to foreign legal entities for concession, as well as to lease out water industry systems and strictures, provided that a license for the right for water use is issued according to the standard procedure, and the rights of other water users are respected.

In the practice of interstate water relations of the Kyrgyz Republic there is a unique experience of creation of Joint Kyrgyz-Kazakh Committee on Use of Water Facilities of Interstate Use on Chu and Talas Rivers. The Committee was founded on the basis of the intergovernmental Agreement signed in 2000.

From 2009 GIZ Project "Transboundary Water Resources Management in Central Asia" funded by the MFA of Germany has been implemented. One of the main tasks of the Project is to draft and adopt

Agreement between Kyrgyzstan and Tajikistan on Use of Water Resources of International Rivers Crossing State Borders of two countries. It is anticipated to form Joint Water Committee of two countries that would serve as a main body for solution of water issues between the countries. The working body plans to create River Basin Committees. According to preliminary draft documents, the competence of River Basin Committees is considered to be sufficient for solution of many issues in operation of the water passage Vorukh-Shurab, including the matters of shared operation, repair, regulation of water use, and creation of a joint enterprise for water passage.

4.3. Analysis of Provisions of Existing Agreements and Treaties of Local Level on "Vorukh-Shurab" Water Pipeline Route

Over the period of examination of Vorukh-Shurab water passage system, including performance of field trip and meetings with public utilities company's employees of Shurab community, as well as request and preparation of analysis of regulatory acts on relationships in WPR operation and legal regime, no design documentation on water passage was found. The design documentation should have acts for land allocation to build water passage, conditions for water distribution to appropriate villages and settlements located along the water pipeline route in order to determine a legality of use of respective volumes of water for drinking and irrigation needs by population. The principal point was to identify the places of allotment of water and design water volume at each point of water allotment.

Review of existing normative acts was performed on the basis of available copies of documents at local level.

Agreement on Joint Use of Water Pipeline Route "Shurab"

1.This Agreement was concluded in Batken City on December 9, 2001. The Parties are the state administrations of Batken Rayon of the Kyrgyz Republic, Isfara Rayon of the Republic of Tajikistan, non-governmental organization "Ittifok" (RT) and Public Fund "For International Tolerance" (KR).

2. The Agreement's structure includes Preamble and six articles.

3. Content of the Agreement:

Preamble is based upon acknowledgement by the parties of the need to comply with the rules of legal norms in the water use area, which prevent mutual claims and secure enforcement of inter-district/interstate agreements and the objective of the Agreement is to create conditions for development of good neighborhood relations.

Sets acknowledgement by the parties of the need to regulate and arrange rules for water use of WPR "Vorukh-Shurab" and states the fact of increased tension in ethnic and interstate relations regarding this water pipeline (paragraph 1).

Declares commitment of the state administrations – the parties to the Agreement for the purpose of ensuring sustainable work of WPR "Vorukh-Shurab" to undertake actions on their territories to organize interaction between government bodies with NGOs, international and commercial organizations, and perform technical projects that would be aimed at solution of issues of concern of the communities located along WPR "Vorukh-Shurab" (paragraph 2);

Other paragraphs (3-6) of this Agreement have the meaning of quasi-active activity of the parties: disconnecting illegal water discharge outlets, undertaking joint actions to ensure sustainable operation of water pipeline, conduct quarterly and monthly check up of water pipeline, perform public outreach, intensify activity of NGOs to resolve drinking water issues, strengthen friendly relations, and develop good neighborhood traditions.

Based on comparative analysis of the Agreement's structure and content, it would be appropriate to conclude that this document developed under the project, does not comply with norms for drafting acts for such purpose. It is rather a sort of Protocol on Intentions for Cooperation between the Parties, whereas cooperation does not stipulate any rights and obligations, and procedures for responsibilities.

Multilateral Agreement on Operational Mode of "Vorukh-Shurab" Water Pipeline Route

1. Agreement concluded in October 8, 2002 in Shurab City, Isfara Rayon of the Republic of Tajikistan. The Parties to the Agreement are organizations concerned – Hukumat of Shurab City and Public Utilities Service of Shurab City (RT), Samarkandekskyi, Aktatyrkskyi and Aksaiskyivillage councils of Batken Rayon (KR), Water Committee "Andigen-Suu", communities (jaomats) of Vorukh and Chorkukh (RT).
2. The subject matter of the Agreement is to ensure efficient operation of "Vorukh-Shurab" WPR with allocation of responsibilities (presumably by efficient operation) by water pipeline sections located on the territories of the countries, between the Public Utilities Service of Shurab City and Water Committee "Andigen-Suu".
3. Paragraphs 1 and 2 of Section II of this Agreement stipulate the following duties of the Public Utilities Services and Water Committee:

- transfer and undertaking of authorities to control relevant sections of water pipeline between them;
- prevention of unauthorized connections, except for agreed;
- carrying out joint control inspections;
- implementation of timely repair of water pipeline (funding source is not specified);
- collection of payment for water use on their territories (tariff rate is not clear, as well as a collection method and spending of funds collected);
- material responsibility in case of new unauthorized hookups to the water pipeline (not specified who and how, and under which body);
- in our opinion, the most important point is that the number of authorized (presumably, agreed) water discharge outletsis listed for village councils in Kyrgyzstan and Tajikistan along the water pipeline route.

4. Paragraphs 3 and 4 of the Agreement envisage duties of village councils of Kyrgyzstan and jamoat of Tajikistan on rendering full support (?) to the Public Utilities Service and Water Committee "Andigen-Suu" regarding actions to liquidate illegal hookups(presumably, except for those agreed) and participation in regular joint control over water pipeline route with the view to prevent repeated hookups. The Agreement of December 9, 2001 is the justification for such duties.

This Agreement is a compilation of provisions of Memorandum with a business contract and maybe, by a long stretch of the imagination, called a consensual business contract.

Bilateral Agreement on Operation Mode of "Vorukh-Shurab" WPR with a view to supply water for residents of Shurab jaomat

1. Concluded on November 3, 2010 in Shurab City (RT) between the Public Utilities Service of Shurab City and Public Association of Water Users "Andigen-Suu".

2. Resembles the previous agreement (but on bilateral basis, without other parties involved). The grounds for conclusion are two aforementioned agreements.

3. Duties similar to the previous agreement are envisaged.

4. Principal difference is that the number of permitted hookups increased.

This Agreement is a treaty between two economic entities. However, the contract does not specify all principal conditions. In our opinion, the need to conclude this contract was caused by the change in the legal status of "Andigen-Suu" PAWU (former Water Committee).

4.4. Main Conclusions on Legal Framework Analysis

1. Legal tools for intercountry partnership, interaction and coordination, expansion and deepening of bilateral cooperation are based on more than 70 interstate, intergovernmental and interagency treaties, covering different activities concluded from the date of establishment of diplomatic relations between Kyrgyzstan and Tajikistan on January 14, 1993. There is a solid regulatory basis for cooperation in many activities at the interstate level.
2. Altogether, there is a need to regulate bilateral relations in water use, including the need to determine common positions regarding water use across the Central Asian region. GIZ Program "Transboundary Management of Water Resources in Central Asia" drafts a respective Agreement. The program of works anticipates creation of Joint Water Committee of two countries for cooperation in the area of use of international rivers water resources and executive bodies – Basin Committee and Secretariat. Foundation of Isfara River Basin Committee allows settling most of issues related to functioning of "Vorukh-Shurab" WPR, its repair and operation, including establishment of joint bodies on operation of the water passage.
3. No works were performed to identify property right for "Vorukh-Shurab" WPR pursuant to stipulated working procedures under bilateral Intergovernmental Committee of the Kyrgyz Republic and the Republic of Tajikistan according to the Agreement on Mutual Recognition of Rights and Regulation of Property Relations dated October 9, 1992.
4. There are acting interstate-level official documents adopted jointly by superior competent bodies of the states. Following their requirements, it is prohibited to perform any construction works on cross-border land before borders are delimitated and demarked. Although a possibility to make a special agreed decision by two countries on this specific issue is not fully excluded. The process for such decision-making may be prolonged and long-standing.
5. Existing local-level contracts and agreements reviewed in this analysis on operation of "Vorukh-Shurab" WPR are a sort of Protocol on Intention for Cooperation between the parties or a consensual business contract.

4.5. Proposals for Transit Fee With Respect to Operation of "Vorukh-Shurab" Water Pipeline Route

As noted above in the review of legal framework of interstate water relations of the Kyrgyz Republic and the Republic of Tajikistan regarding operation of "Vorukh-Shurab"WPR, no works were performed to identify property rights for the facility - "Vorukh-Shurab" WPR – in accordance with the working procedures established under Bilateral Intergovernmental Committee of the Kyrgyz Republic and the Republic of Tajikistan pursuant to provisions of the Agreement on Mutual Recognition of Rights and Regulation of Property Relations dated October 9, 1992. Under Article 13 of the Agreement on Mutual Recognition of Rights and Regulation of Property Relations dated October 9, 1992, ratified by Resolution No. 1404-XII of Jogorku Kenesh of the KR (on January 12, 1994), activity of enterprises, institutions, organizations and other facilities located on the territory of the Kyrgyz Republic and which were under control of the government bodies of other former USSR republics as of December 1, 1990, as well as property of other legal entities and individuals recognized under Article 2 of this Agreement as property of the other Party, shall be regulated under the laws of the Parties on the territory of which they are located, unless otherwise stipulated by other agreements of the Parties.

Territorial units of the State Property Fund of the Kyrgyz Republic in compliance with Article 12 of the abovementioned Agreement should identify by Protocols, together with the bodies of another Party authorized to manage the state property, a legal status of previously formed enterprises, which are recognized under this Agreement as a property item of the other Party and located on the territory of the Kyrgyz Republic. The same procedure should be applied for a legal status of facilities of the Kyrgyz Republic located on the territory of the other Party.

Decision options would be different: whether it will be sales/purchase, exchange, transfer to collateral, rent, gratuitous transfer or transfer on a contractual basis of this property item to the other Party, in the form of a joint enterprise or a foreign enterprise in conformity with existing legislation of the location. The Protocol was also to specify that from the moment of entering into force of this Agreement or from the moment of signing of Protocol on Agreement of Parties they should be registered in respective bodies per se, and bear fiscal obligations according to its location.

Under Article 10 of the Declaration on State Sovereignty of the Republic of Kyrgyzstan (dated December 15, 1990) enterprises, institutions, organizations and facilities of other countries and nationals, and international organizations may be located on the territory of the Republic and use natural resources of Kyrgyzstan in compliance with its laws. Pursuant to Article 3 of the named Agreement property rights for land and other natural resources are regulated by the legislation of the Parties, on the territory of which the property items are located, unless otherwise is stipulated by other agreements of the Parties. Therefore, local tax bodies should produce a requirement to pay taxes for land use at current rates over each period, starting from the moment of getting independence.

To determine the operational mode of "Vorukh-Shurab"WPR, the principal provisions of the legal treatment for land use in the Kyrgyz Republic should be reviewed on the basis of existing legislation.

4.6. Key Provisions of Legal Treatment for Land Use in the Kyrgyz Republic

1.1. In Soviet times, only the state land property was legally acknowledged. After getting independence, the land and agrarian reform has started in Kyrgyzstan. In the process of these reforms significant changes took place in land property area. Following all-nation referendum in 1998,which introduced changes into Article 4 of the Constitution of the Kyrgyz Republic, land may be in the state, municipal and private and other forms of ownership.

1.2. Property right is the right of the subject to own, use and dispose of property belonged upon its discretion, and such right is acknowledged and protected by legislative acts (Article 222 of the Civil Code of the KR).

Under Constitution of the Kyrgyz Republic, land may be in state, communal, private or other forms of ownership (Article 4 of the Land Code).

Right of state ownership of land enjoys the Government of the Kyrgyz Republic on the entire territory of the Republic and local state administrations within the competence established by the Land Code (LC).

1.3.The right to land plot shall be created by:

- allocation of the right to land plot in the procedure established by the Land legislation;
- assignment of the right to land plot on the basis of civil law transactions;
- transfer of the right to land plot in accordance with the procedure of universal succession;
- on other grounds provided by legislation (Article 22 of LC).

In cases where the land plot is allocated into ownership or for use by an authorized agency, the documents certifying the rights to land shall be as follows:

- in the event of private ownership to a land plot - the governmental act on the right of private ownership to land plot;
- in the event of termless use of a land plot (without definite term) - the governmental act on the termless (without definite term) use of land plot;
- in the event of fixed-term (temporary) use of land - the certificate of the right of temporary use of a land plot or the agreement on lease;
- in the event of allocation of a land share - the certificate of the title to a land plot (private property right for land plot).

Forms of documents specified shall be subject to mandatory state registration (Article 31 of the LC).The documents certifying the rights shall be subject to mandatory state registration.

1.4. The following shall not be transferred for the private property:

- Pastures;
- Land of forestry and water resources funds;
- Land in Common Use lands for common use of cities and settlements (roads, streets, sideways, water reservoirs, passages, parks, avenues, public gardens);
- preserves, natural monuments, national natural and dendrological parks, botanical orchards;
- Land polluted by dangerous substances and exposed to biogenic contamination.

Land plots shall not be transferred into ownership to:

- Foreign legal entities and individuals;
- Married couple, if one of the spouses is a citizen of a foreign country or a stateless person;
- Stateless persons residing in the territory of the Kyrgyz Republic.

1.5. Under Article 6 of the Land Code of the Kyrgyz Republic:

- Right to land plot shall be a special subject matter of civil rights and may be the subject of sale, donation, exchange, mortgage and other transactions; the rights to land may also be transferred in compliance with the procedure of universal succession subject to limitations established by the Land Code.
- The right to land may be acquired on a charge-free or on a compensatory basis
- No one may be deprived of the rights to land plot on any grounds other than those provided by law.
- State authorities and local self-government bodies shall be prohibited to interfere in the activities of land owners or land users on use of land plots, except in cases where the land owners or the land users violate the provisions of land legislation.

1.6. Withdrawal of a land plot shall be an exceptional measure of termination of the right to a land plot and shall be applied only by the court after written notification of the land plot owner/user about elimination of the violation, application of the administrative liability to natural or legal persons, except for the cases specified in subparagraphs 2, 3 of point 1 of Article 66 of the Land Code.

Withdrawal of the land plot shall be allowed in the event of:

1) utilization of a land plot in violation of its targeted use;
2) withdrawal (redemption) of the land plot for state and public needs in accordance with provisions of this Chapter;
3) failure to use a land plot or part of the land plot allocated for agricultural production within three years;
4) failure to use a land plot allocated for non-agricultural production in accordance with the town-planning legislation;
5) failure to pay land tax within the period established by tax legislation.

Land plots withdrawn on the grounds provided by subparagraphs 1,3,4,5 of point 1 of this Article may be traded at auctions.
Withdrawal of the land plot in cases provided in subparagraphs 1,3,4 of point 1 of this Article shall be produced with payment of the value of the right to land plot to the owner or user of the land plot less expenses connected with withdrawal of the land plot and arrangement of auctions.
Withdrawal of the land plot for state and communal needs shall be performed after payment of the value of the right to land plot and compensation of losses.

1.7. Authorized government bodies referred in Articles 13-17, 20, 21 of the Land Code of the Kyrgyz Republic shall be assigned to allocate land plots:

- Executive bodies of ayil and village Kenesh on lands within ayil and village Kenesh boundaries;
- City administrations on lands within the city boundaries;
- Rayon state administrations on lands within the boundary of a rayon, pastures in the zone of intensive use

- Oblast state administrations on lands within the boundary of oblast, and distant pastures.

Pursuant to Article 7 of the Land Code of the Kyrgyz Republic:

1. The use of a land plot may be termless (without indication of term) or fixed-term (temporary).
2. The fixed-term (temporary) use of the land plot including the use right on the conditions of the lease agreement shall be recognized the use of land limited in term up to 50 years.After expiration of this period, the period of use of the land plot may be prolonged subject to the agreement of parties.
3. Land plots shall be provided to foreign individuals for fixed-term (temporary) use only.
4. Agricultural land of Reallocation Fund shall be leased out as a rule for the period of not less than 5 years.

1.8. Allocation and transfer of agricultural land plots to foreign persons into ownership shall not be allowed.

The land plots within the boundaries of a settlement (cities, villages, rural settlements) may be provided to foreign persons, foreign legal entities on the rights of fixed-term (temporary) use or may be transferred into ownership in case of mortgage financing of housing construction in accordance with the Mortgage law of the Kyrgyz Republic.

The land plots outside settlements, except agricultural land, may be allocated to foreign persons on the rights of fixed-term (temporary) use by the Government of the Kyrgyz Republic. In other cases, land outside settlements shall be allocated, transferred, assigned to foreign persons in the procedure of universal succession for fixed-term (temporary) use (Article 5 of the LC).

1.9. Land tenure in the Kyrgyz Republic shall be compensatory for all legal entities and individuals, except for state and communal land users financed from the budget and under the procedure defined by the Government of the Kyrgyz Republic (Article 8 of the LC).

Agricultural lands and lands for non-agricultural needs shall be subject to taxation, including:
- Land of rural settlements (cities, villages, rural settlements, etc.)
- Land of industry, transport, communication, and other designation, including land for defense purpose;
- Land for environmental protection, medical and health care, recreational, and historical and cultural purpose;
- Land of forestry fund;
- Land of water resources fund;
- Land of reserve.

1.10. Payment for land shall be made in the form of land tax, tax on real estate or rent for use of the land.

Land tax rates and the procedure of payment shall be developed by the Government of the Kyrgyz Republic, shall be adopted by Parliament of the Kyrgyz Republic. Tax rates for agricultural lands shall be established depending on the quality (fertility) of soil, location of the land plot. Tax rate for non-agricultural lands shall be established depending on the infrastructure and various town-planning value.

Payment for land use shall be mandatory for all legal entities and individuals, except for state and public land users funded by the budget.

Payers of the land tax shall be land users regardless of their ownerships form, when the land use rights are certified by a special documents of a standard form: state act, temporary certificate, certificate on the right to use land plot or a share, regardless whether the land area provided is used or not.

1.11. Land tax rate for agricultural lands shall be established depending on the quality (fertility) of soil, location of the land plot. Tax rate for non-agricultural lands shall be established depending on the infrastructure and various town-planning value.

Tenant pay rent payment which amount is determined upon agreement by the parties based on the contract. Pursuant to Article 178 of the Tax Code, the land tax for leased land shall be paid by the tenant at rates approved by Parliament of the Kyrgyz Republic.

1.12. Land rent is use of a land plot upon agreement with land plot owner at a specific payment.

Conditions and procedure of giving land for lease shall be determined upon the agreement by the parties and stipulated by the contract. Pursuant to Article 7 of the Land Code of the Kyrgyz Republic as amended on April 30, 1999, the use of a land plot may be termless (without indication of term) or fixed-term (temporary).

The fixed-term (temporary) use of the land plot including the use right on the conditions of the lease agreement shall be recognized the use of land limited in term up to 50 years.

Agricultural land of Reallocation Fund shall be leased out as a rule for the period of not less than 5 years.

1.13. According to Article 5 of the Land Code transfer of the agricultural land plot to the foreign persons shall not be allowed.

Pursuant to paragraph 4, Article 8 of the Land Code of the Kyrgyz Republic, should the use rights to land plots situated within the territory of the Kyrgyz Republic be allocated to a foreign state, the amount of payment shall be specified by an agreement between the Kyrgyz Republic and the foreign state. Interstate agreements on allocation of the land plots for use shall be subject to ratification by the Parliament of the Kyrgyz Republic.

1.14. Appraisal of the value of land shall be performed taking into account its qualitative and quantitative features, location, targeted use, environmental condition, and other factors.

Appraisal of land of all land fund categories shall be applied to ensure economic regulation of land relations throughout the Kyrgyz Republic.

1.15. Normative price of land is an indicator of the land value of specific quality and location based on the potential profits during the estimated period of return and established level of market prices.

Normative price of land is applied at purchase by nationals and legal entities from the state additional land plots in excess of the established norms for free, at sale of land plots into private ownership, to conclude mortgage contract in the process of bank credit formalization, for levying state duty on sale of land plots by owners and at sale at auctions, redemption of losses and damage when land is withdrawn for the state and public needs, establishment of the land tax rate and rent payment for use of agricultural lands.

1.16. Land of settlements shall include the entire land within the boundaries of a settlement.

The entire land within the settlement boundaries shall be controlled by a corresponding authorized territorial body (Article 76 of the KR LC).

1.17. Land in common use of cities (settlements) shall consist of land used as communication lines, or for satisfaction of cultural and household needs of the population (roads, squares, sideways, passages, parks, avenues, public gardens, water reservoirs and etc.).

Land in common use of cities (settlements) shall not be allocated into ownership. In exceptional cases they may be allocated by the authorized body for fixed-term (temporary) use to individuals and legal entities for lease for the period of up to five years.

1.18. The land plots within the boundaries of a settlement (cities, villages, rural settlements) may be provided to foreign persons, foreign legal entities on the rights of fixed-term (temporary) use or may be transferred into ownership in case of mortgage financing of housing construction in accordance with the Mortgage law of the Kyrgyz Republic (Article 5 of the LC).

Land plots outside settlements except agricultural land, may be allocated to foreign persons on the rights of fixed-term (temporary) use by the Government of the Kyrgyz Republic. In other cases, land outside

settlements shall be allocated, transferred, assigned to foreign persons in the procedure of universal succession for fixed-term (temporary) use.

1.19. Land of settlements shall be used for the purposes set out in the documents certifying the rights to a land plot, in an agreement or other title establishing documents.

Land of settlements shall be used in accordance with the general plans, schemes of planning and construction, and schemes of internal land organization of settlements (Article 77 of the KR LC). Allotment (separation) a land plot with the establishment and fixation of its borders at site shall be performed in accordance with a decision of an authorized agency(Article 1 of the KR).

1.20. Land use fee is determined by the Law on Base Rates of the Uniform Agricultural Tax and Use of Household Plot and Garden Plots. Tax rate for the right to use household plots and garden land plots provided for land users in large cities shall be 0.16 KGS/m2, and in other cities and settlements – 0.08 KGS/m2, and in rural settlements – 0.04 KGS/m2.

In compliance with provisions of the Law of the Kyrgyz Republic "On Local Self-Government and Local State Administration" of May 29, 2008, No. 99 (Article 18), the competence of the local self-government bodies, inter alia, covers provision of population with drinking water and establishment of the rules for land use and construction on a relevant territory of a settlement.

In light of the mentioned right for establishment of rules for land use by the local self-government bodies, it should be noted that two hectares of irrigated lands and 11.5 hectares of dry-lands and about 1 hectare of land of settlements were allocated for WPR "Vorukh-Shurab".

The category of land, across which the route of the water pipeline "Vorukh-Shurab" passes, should be specified, as it has an effect on the level of an appropriate decision-making government body, regarding compensation under the KR legislation. This fact also influences on the amount of land tax paid for use of land under the water passage.

4.7. Proposals for Possible Solution of Transit Fee Issues or Alternative Solutions

1. Solution of the water pipeline functioning in the operational mode is possible in the light of proposals by representatives of the local self-government bodies of Kyrgyzstan in the form of payment of fee for water transit across the land of local communities of Kyrgyzstan.
2. Fee amount may be determined under the following principles:
    - The principle of economic feasibility, under which rent payment shall be determined in the amount corresponding to the profitability of the land plot by the land category and its permitted use (rent payment for a land plot should be determined under the state regulation of tariffs (for goods, works, and services) for organization that carry out an activity on such land plot);
    - The principle of non-admission of worsened economic condition of land users and land owners. Under this principle the amount of rent payment established because of reregistration of rights for land plots, should not exceed more than twofold the amount of land tax for such land plots;
    - The principle of the need to support socially critical activities by establishment of the amount of rent payment within the limit not exceeding the land tax rate, as well as protection of interests of persons exempted from payment of land tax;
    - The principle of prohibition of unjustified preferences. According to this principle the amount of rent payment for land plots designated for similar activities shall not vary.
3. Local self-government bodies of Kyrgyzstan under provisions of acting legislation shall have the right to establish the procedure for determining the amount of rent payment, procedure, conditions and terms for rent payment for municipal lands. It is recommended that the amount of

payment should be commensurable with the amount of land rent payment. Such recommendation is based on the fact that water supply for several villages of Kyrgyzstan is also performed from "Vorukh-Shurab"WPR.

4. Possible ways for such step is to conclude an agreement between two countries on "Vorukh-Shurab" WPR separately and incorporate provisions on transit fee and portion of water resources from the water pipeline for the Kyrgyz villages in Batken rayon. It is possible to envisage water transit rates in the Agreement.

5. Negative prerequisites of this step are the possibility to incorporate the requirement for right-of-way for water pipeline in the provisions of the Agreement, strict compliance of the ROW boundaries, and conformity with the established limit of water and shared participation in maintenance costs. These requirements may become an impossible condition or difficult to enforce.

6. With due consideration of the above stated principles for calculation of the value of rent payment for the category of land of settlements and land for non-agricultural needs, it is possible to use acting base land tax rate and apply the ratio established by the Government in the Republic. Today, the Regulation is effective and approved by Resolution No. 543 of the Government of the Kyrgyz Republic of September 29, 2008 "On Introducing Amendments into Resolution No. 260of the Government of the Kyrgyz Republic of April 12, 2006 "On Approval of the Ratio for Establishment of the Amount of Rent Payment for Foreign Persons for Use of Land of Settlements and Land for Non-Agricultural Needs". In compliance with this Regulation the previously established ratio 4 was decreased by 1.

   For the land for non-agricultural needs an amount of payment may be calculated based on the land tax rates, plus estimated amount of lost profit of agricultural production over the period of lease.

5. Technical Assessment of the Facility

Within the complex survey of existing "Vorukh-Shurab"WPR, actual water flow was measured based on the preliminary report upon results of field survey of "Vorukh-Shurab" water supply facility by the team of experts of CAIConsulting Company. This work was fulfilled under OSCE Project "Sustainable Use and Management of Water Resources in the South of Kyrgyzstan" from April 24-29 of 2012 and following the Terms of Reference.

Measurement of actual flows was performed from July 3 to 4, 2012 by a team of specialists "Grundfos", under supervision of Mr. Ignatenko D.N. and Mr. Fokin V.N.

For the purpose of measuring flow ultrasonic clamp-on flow meters were applied (Appendices 7-9):

- **SiemensSITRANSF1010 –FLOWMETER**
- **SIERRAModel 210 Series**

The need for survey has emerged as a result of determining an extent of impact of losses along the water pipeline route, so that to identify the most critical sections. The objectives for measuring of actual water flow rate were the following:

- Determining actual flow on the measuring points;
- Determining the most critical sections along the water pipeline route;
- Collection of source data required for appraisal works of reconstruction and decrease of unmetered water losses;

Upon results of the survey ***hydraulic grid model*** was prepared, which was approximated to the real setting, as much as possible. Based on the results gained the actions were identified for water loss reduction on the water pipeline and recommendations presented to improve the water pipeline operation; amounts of capital expenses were estimated for restoration of the system efficiency.

Tasks of Technical Assessment of the Facility:

- Collection of actual data with the help of ultrasonic water flow meters at the water pipeline points in order to identify the key technical issues related to operation of the water supply facility by the Kyrgyz and Tajik water users.
- Calculation of total water consumption by consumers connected to the water pipeline in view of legal and illegal hookups. Determining the capacity of water intake facility and analysis of real setting.
- Development of hydraulic water passage model based on EPANET software in order to analyze the situation related to "Vorukh-Shurab"WPR.
- Detailed analysis of possible technical solution to decrease water losses with development of alternative options.
- Preparation of economic feasibility for possible technical options.
- Elaboration of recommendations on operation of "Vorukh-Shurab" water pipeline route.

To achieve the tasks set, the following methods of data collection and analysis were employed:

-Field works, including data acquisition with the help of ultrasonic water meter flows at the water passage points.

-Empirical calculation of the capacity of water intake facility, determining the schedule of daily irregularity and total amount of water consumed.

-Creation of hydraulic model on the basis of data acquired, with a possibility to simulate a situation on water consumption depending on the conditions set.

5.1. Measurements

The first stage following the objectives set was to conduct field works along the water pipeline route. On the basis of the task set the program of field measurements was developed, measuring points on the water pipeline and the time of measurement of actual flow rates were specified.

Measurements on actual flow rates were implemented pursuant to requirements of acting Construction Norms and Rules (SNiP), with due regard of the modern level of machinery development and methods for performance of this type of works. The objectives set were achieved by instrumental survey with the use of ultrasonic water flow meters.

Because of impossibility to conduct measurements on the Tajik territory, we developed the methods of measurement along the section of "Vorukh-Shurab" WPR located on the territory of Kyrgyzstan, which could reflect actual water distribution on pipeline sections along the entire length. The main measuring points were identified for this purpose (See Picture 1).

Measurements were performed by the following way:

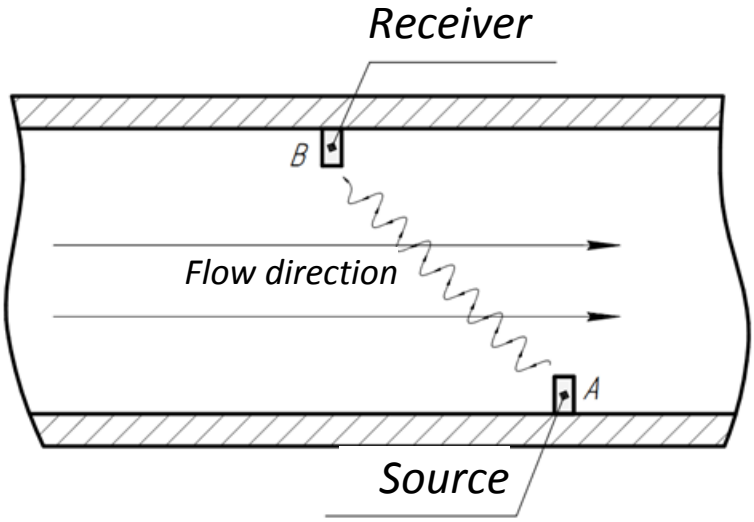
Day 1 – one water flow meter was installed at exit from Vorukh (Point 1), and the second meter - on entry to Shurab on the border with Tajikistan (point 4). The measurement is made with the cycle of one hour in 24 hours.

Day 2 – points 2-3. The measurement is made with the cycle of one hour in 24 hours.

Picture 1:Layout of Points for Collection of Data along the Water Pipeline Route

The principle of operation of ultrasonic water flow meters is shown on Picture 2. The devices of such type use the feature of sonic waves to change the speed of propagation of sound in a movable setting. If to set the Source (A) and the Receiver (B) of ultrasonic water flow meter with shift (Picture 2), then the flow speed will be shown as change in the speed of propagation of sonic waves along AB segment.

Picture 2: General Layout of Key Elements of Ultrasonic Water Flow Meters




Picture 9,10. Preparation of Ultrasonic Water Flow Meter at the Measuring Point

At the preparatory stage, water passage and measuring places were surveyed. The survey showed that access to water passage to install a sensor is available at Point 2 only. Measuring points 1, 3, and 4 are located below the ground.

The host party was informed on the need to do earth works. Because of unpreparedness of the water passage for measurements, the program was changed. The changes were made on Day 2 (August 3, 2012) in Points 1 and 2, and on Day 3 (August 4, 2012) in Points 3 and 4. Earth works in Point 1 and 3 were done on August 2, 2012. Preparation of Point 4 was done on August 3, 2012 with the use of tractor. The depth of the cave for measuring in Point 4 was over 2.5 meters.

Based on data received, the table of actual water consumption on water passage sections was built.

Table 12:Measuring Results at Points of "Vorukh-Shurab" WPR

Date/Time	Point 1	Point 2		Date/Time	Point 3	Point 4
03.08.2012/08-00	1075 m3/h	974 m3/h		04.08.2012/08-00	583 $м^3/ч$	34 $м^3/ч$
03.08.2012/09-00	1080 m3/h	977 m3/h		04.08.2012/09-00	586 m3/h	35 m3/h
03.08.2012/10-00	1070 m3/h	974 m3/h		04.08.2012/10-00	588 m3/h	37 m3/h
03.08.2012/11-00	1072 m3/h	973 m3/h		04.08.2012/11-00	587 m3/h	35 m3/h
03.08.2012/12-00	1083 m3/h	978 m3/h		04.08.2012/12-00	592 m3/h	36 m3/h
03.08.2012/13-00	1085 m3/h	980 m3/h		04.08.2012/13-00	594 m3/h	37 m3/h
03.08.2012/14-00	1087 m3/h	982 m3/h		04.08.2012/14-00	592 m3/h	38 m3/h
03.08.2012/15-00	1091 m3/h	984 m3/h		04.08.2012/15-00	597 m3/h	41 m3/h
03.08.2012/16-00	1089 m3/h	981 m3/h		04.08.2012/16-00	596 m3/h	43 m3/h
03.08.2012/17-00	1092 m3/h	984 m3/h		04.08.2012/17-00	598 m3/h	46 m3/h

03.08.2012/18-00	1091 m3/h	983 m3/h		04.08.2012/18-00	602 m3/h	44 m3/h
03.08.2012/19-00	1088 m3/h	986 m3/h		04.08.2012/19-00	603 m3/h	42 m3/h
03.08.2012/20-00	1087 m3/h	984 m3/h		04.08.2012/20-00	598 m3/h	38 m3/h
03.08.2012/21-00	1088 m3/h	983 m3/h		04.08.2012/21-00	587 m3/h	34 m3/h
03.08.2012/22-00	1089 m3/h	985 m3/h		04.08.2012/22-00	584 m3/h	33 m3/h
03.08.2012/23-00	1080 m3/h	987 m3/h		04.08.2012/23-00	582 m3/h	34 m3/h
03.08.2012/24-00	1077 m3/h	982 m3/h		04.08.2012/24-00	583 m3/h	33 m3/h
04.08.2012/01-00	1075 m3/h	973 m3/h		05.08.2012/01-00	578 m3/h	32 m3/h
04.08.2012/02-00	1070 m3/h	972 m3/h		05.08.2012/02-00	574 m3/h	33 m3/h
04.08.2012/03-00	1074 m3/h	970 m3/h		05.08.2012/03-00	574 m3/h	35 m3/h
04.08.2012/04-00	1072 m3/h	971 m3/h		05.08.2012/04-00	573 m3/h	34 m3/h

Data obtained allow to see the real picture of water losses along the water pipeline route. The main reasons having an impact on decrease of water supply to end-users are the following:

- A lot of hookups. The pipeline was a lot of taps, including illegal.
- Lack of proper operation of water pipeline route and timely repair and restoration works on surveyed pipeline sections. There are a lot of leakages. It should be noted that gate valves to disconnect for performance of repair works on the pipeline are destroyed, and there are considerable leakages at the gate valves sites. Preventive works for cleaning and discharge of sand sediments along the water pipeline route are not performed. That is why, there is silting and decreased discharge capacity of water pipeline on the lower sections. The pipeline has inner sediments at Point 4 because of drop of geodetic altitude between Point 4 and Shurab City.
- Water intake facility is constant within 24 hours and has little variations. This is mostly because there are no shut-off and control valves at the places of junctions of the pipeline.

Analysis of data received allowed to determine the most problematic route sections. First of all, this is Section 2-3 (water losses about 9400 m3/day) and Section 3-4 (water losses are 13200 m3/day). The principal cause for water losses on these sections is high density of housing developments and, consequently, unauthorized hookups. Meanwhile, these sections are located at the lowest points and if there is a hookup with no control valve in place, the discharge through the 20mm pipe would be 1-2 l/second. This is a considerable indicator. In addition, there are huge losses at the water pipeline sections in critical condition.

Picture 11: Section in critical condition on water pipeline route between Points 3 and 4

Valve designed for discharge and cleaning of water pipeline is destroyed. Flange coupling has considerable leakage. Water losses on this Point are 7-10 l/sec.

Picture 12:Section in critical condition on water pipeline between Points 3 and 4.

Valve for disconnection of pipeline section to be repaired is also in critical condition and has strong leakage. Water losses on this point are 12-15 l/sec.

Results of field works are used as the basis to identify mathematic model of water passage. To get a detailed picture along the entire water pipeline route and because of the impossibility to undertake measurements on the Tajik territory, the following data was received by estimate:

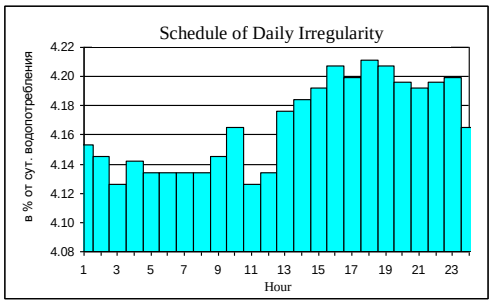
- Schedule of daily irregularity of water consumption at the measuring points. With this data available, average schedule of water distribution within a day along the entire water pipeline route was obtained;
- The discharge along the water pipeline route was computed given the number of residents connected to the system. The analysis of total water demand was carried out on the basis of data available;

- The capacity of water intake facilities was identified and the assessment of overall system capacity was given.

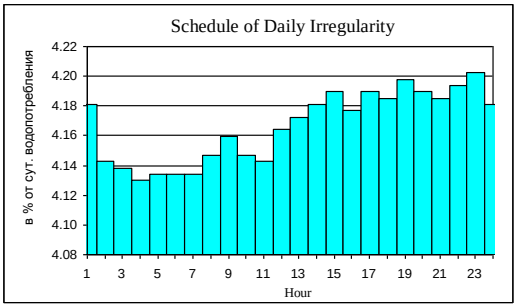
Schedule of Daily Irregularity:

The key factor, which defines operational mode of all elements of the water supply system, is the mode of water consumption by users to be supplied from this system. The schedules of water consumption mode are laid down as the basis of computation of hydraulic model and allow to identify the system work at any point in the given period of time with better probability.

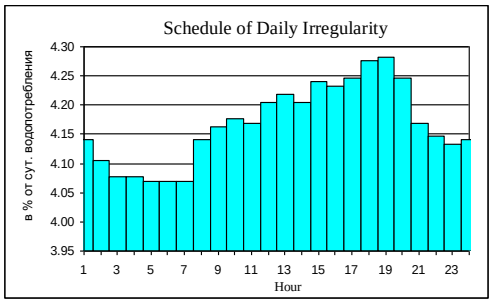
Schedules of water consumption are based on the field works performed. For each point of measuring the daily schedule of irregularity was built. The overall system schedule is used as the average out of four measurements received. Results are shown on charts below:



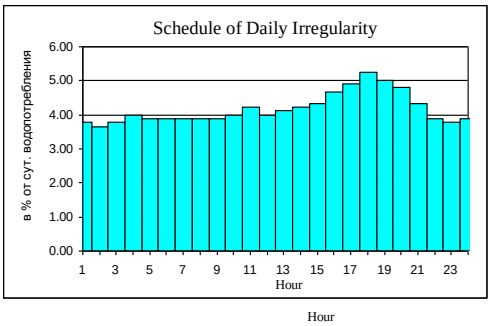
Schedule of Daily Irregularity at Point 1



Schedule of Daily Irregularity at Point 2

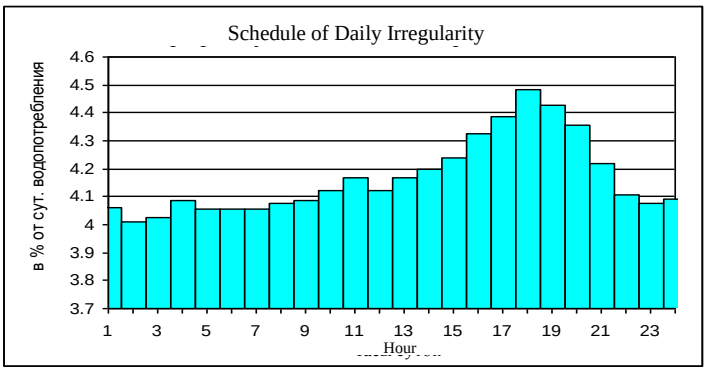


Schedule of Daily Irregularity at Point 3



Schedule of Daily Irregularity at Point 4

Following the results available, we estimated the average schedule along the entire water pipeline route.



Schedule of Daily Irregularity Used for the Entire Water Pipeline Route

5.2. Determining the Capacity of Water Intake Facility and Estimated Water Flow based on Actual Hookups

To determine the water intake capacity the data of measurements held in August 2012 on the water pipeline sections with the help of ultrasonic water flow meters were used as the basis. For estimate purpose, the data on population size living along the water pipeline route, both on the territory of Kyrgyzstan and on the territory of Tajikistan, were applied.

Table 13:Number of People Using Water from WPR "Vorukh-Shurab" in Kyrgyzstan for Drinking Purpose

#	Village	Village council	Number of residents	Water Distribution	
				"Vorukh-Shurab" Water Pipeline Route	"Andigen-Suu" Water Pipeline
1	Kapchygai	Ak-Saiskaya	922	100%	
2	Aksai	Ak-Saiskaya	1221	100%	
3	TashTumshuk	Ak-Saiskaya	625	100%	
4	Uchdobo	Ak-Saiskaya	1976	60%	40%
5	Aktatyr	Aktatyrskaya	3365	50%	50%
6	Ortoboz	Aktatyrskaya	909	100%	
7	Jany-Bak	Samarkandekskaya	1896	100%	
8	Samarkandek	Samarkandekskaya	5624	70%	30%
9	PaskaAryk	Samarkandekskaya	963	100%	

Table 14:Number of People Using Water from WPR "Vorukh-Shurab" in Tajikistan for Drinking Purpose

#	Village	Number of residents
1	Shurab	3000
2	Vorukh	28820
3	Az on mahTochikon	2202
4	Chorkuh	33373
5	HodkaAlo	2983

Population size of Tajik enclaves connected to WPR "Vorukh-Shurab" is 34005 or 40.95% of total number of residents (70378 people). The rate of water consumption was used without regard of water use for irrigation of household plots and it made up 180 liters per day per one person for households. Based on this data the demand for drinking water would be the following:

Table 15: Estimate of Water Consumption on the Territory of Kyrgyzstan

Estimated Water Flow		2012					Water Consumption			
Item	Rate of Water Consumption per 1 resident, liter per day	Household size		m3/day	Max quantity	Min quantity	water consumption, m3/hour			
		%	persons				Q max day K=1.2	Q average per hour	Q max.hour	Q min.hour
Population size			13341		1,37	0,43	2881,66	**120,07**	**163,89**	**51,03**
Consumers from hookup to the water pipeline	180	100%	13341	2401,38						
Owned livestock 20%		20%		480,28						
Unmetered water (20%)		10%		240,14						
Total:				3121,79			3746,15	**156,09**	**213,06**	**66,34**

Table 16: Estimate of Water Consumption on the territory of Tajikistan

Estimated Water Flow		2012					Water Consumption			
Item	Rate of Water Consumption per 1 resident, liter per day	Household size		m3/day	Max quantity	Min quantity	water consumption, m3/hour			
		%	persons				Q max day K=1.2	Q average per hour	Q max.hour	Q min.hour
Population size			34005		1,37	0,43	7345,08	**306,05**	**419,28**	**131,60**
Consumers from hookup to the water pipeline	180	100%	34005	6120,90						
Owned livestock 20%		20%		1224,18						
Unmetered water (20%)		20%		1224,18						
Total:				8569,26			10283,1	**428,46**	**586,99**	**184,24**

On the basis of data received it may be stated that, provided that people connected to the pipeline are 100% supplied with water, the water demand would be as follows:

Total daily consumption: 14030 m3/day

Maximum hourly consumption: 800 m3/day or 222 l/sec

Based on data available for actual measuring of consumption at route points, it may be stated that discharge capacity of water passage at exit from Vorukh enclave is about 300 l/sec or 1080 m3/h. When making measurements the access to the Tajik territory was impossible, therefore, the empirical capacity of water intake was identified. The number of people living in Vorukh according to available data is 28820. Since the percentage of connections across the Tajik territory to the water passage is 40.95%, it may be assumed that there are 11800 water users on the territory of Vorukh enclave. Based on the technique adopted we calculated water demand:

Table 17:Estimate of Water Consumption on the Territory of Tajikistan, Vorukh Enclave

Estimated Water Flow		2012					Water Consumption			
Item	Rate of Water Consumption per 1 resident, liter	Household size		m3/day	Max quantity	Min quantity	water consumption, m3/hour			
		%	persons				Q max day K=1.2	Q average per hour	Q max.hour	Q min.hour
Population size			11800		1,37	0,43	2548,80	**106,20**	**145,49**	**45,67**
Consumers from hookup to the water pipepine	180	100%	11800	2124,00						
Owned livestock 20%		20%		424,80						
Unmetered water (20%)		20%		424,80						
Total:				2973,60			3568,32	**148,68**	**203,69**	**63,93**

Following this data, water intake capacity is the following:

Total daily consumption: 29500 m3/day

Maximum hourly consumption: 1296m3/dayor 360 l/sec

Data acquired serves as the basis for creation of mathematic grid model in EPANET software.

5.3. Hydraulic Model of Water Pipeline Route "Vorukh-Shurab"

Hydraulic computation of "Vorukh-Shurab" WPR was performed with the use of computer software for hydraulic computation EPANET with comprehensive assessment of existing water supply system (water velocity, pressure loss, pressure at all points, actual discharge capacity of pipelines, etc.) EPANET is computer software which simulates hydraulic regime over a long period in pressure pipeline system. The system includes pipes, nodes (pipeline junctions), pumps, valves and water reservoirs.

EPANET software traces water consumption at each pipe, pressure on each node, water pressure on each hookup throughout the system over the period of simulation consisting of many time segments. The software is designed as a research tool, with the view to get better understanding of condition and movement of drinking water in distribution system.

Hydraulic analysis performed allows identifying:

1. Direction of flow distribution, data about water consumption on each section of the system, pressure loss, water velocity, free head on each node.
2. Estimated condition of water supply systems, and their discharge capacity.
3. Boundaries of zones with excessive pressure and insufficient head on grid.

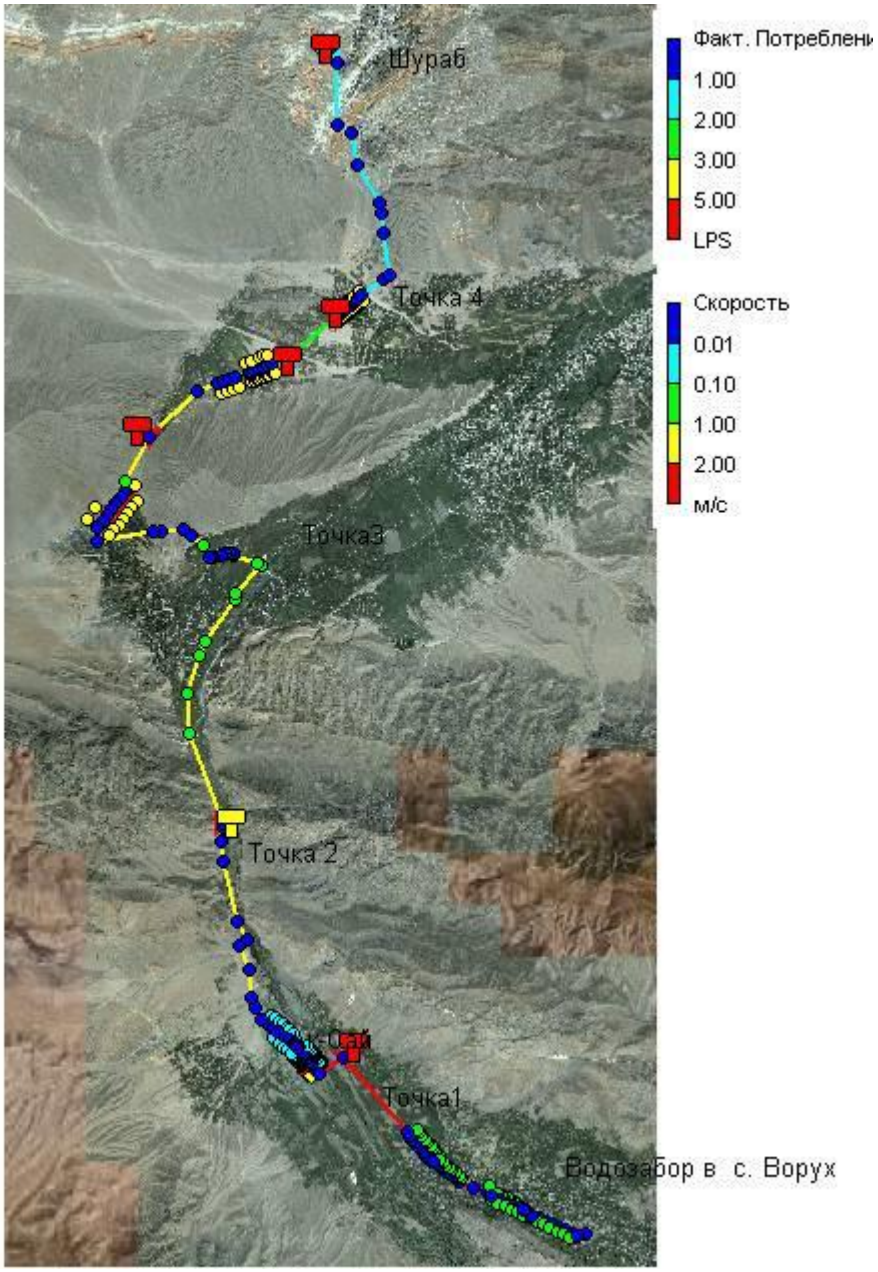
Source data for hydraulic simulation are as follows:

- Plan of pipeline route, including points of hookup. The plan indicates diameter and length of system sections, the pipe material is stated. Elevation marks were received with the use of GoogleMap.
- The data of measurements received were held in August 2012 on the pipeline sections with the use of ultrasonic water flow meters.

The model considers actual leakage and detected hookups, both official and illegal.

As a result of work performed the layout of water pipeline, including elevation marks was obtained.

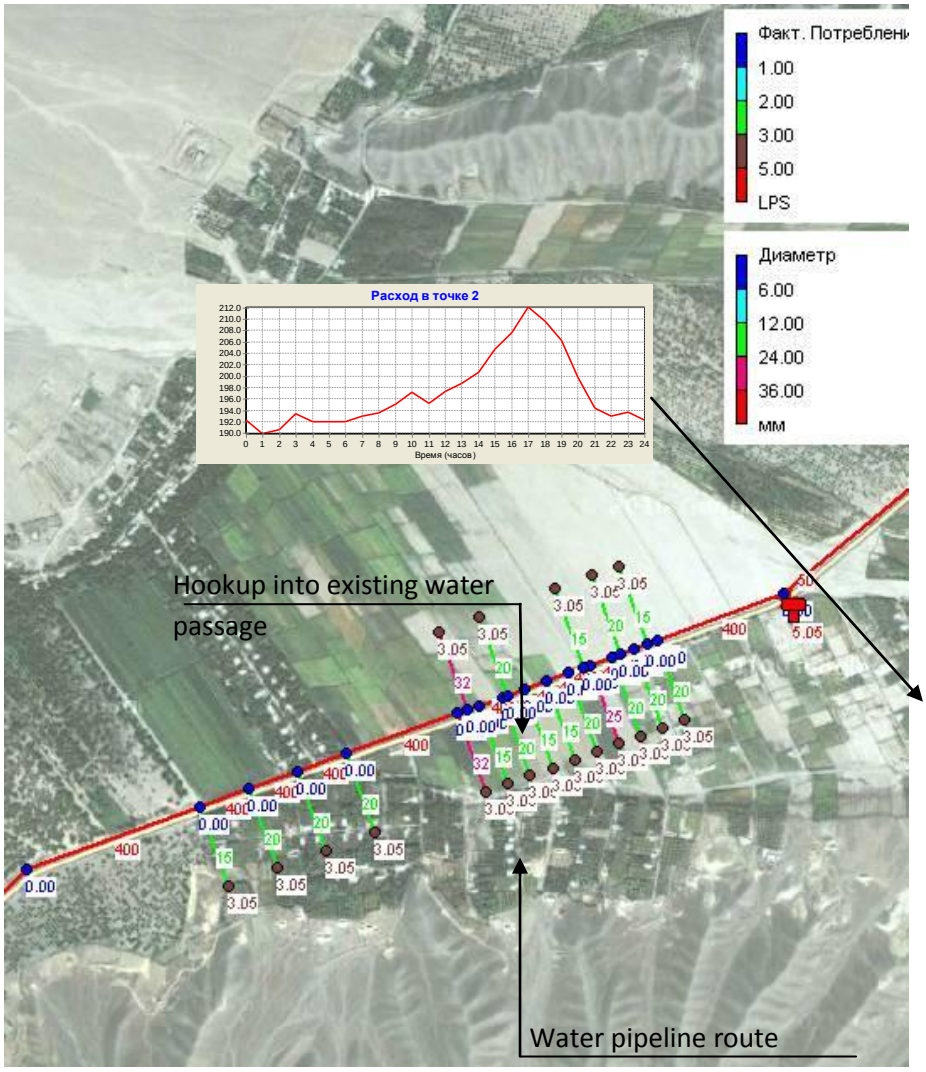
Picture 3:



Key elements of the model are the water pipeline route, hookups with diameters, leakage detected on the system, end-user (data are introduced given the schedule of daily irregularity received).

In the process of simulation of the system the computation was made in view of maximum possible losses, both at hookup points into pipeline, as well as location of detected leakage. The information received allows identifying actual flow distribution along the entire route given seasonal fluctuations. For the purpose of route simulation in winter period, the ratio of seasonal irregularity was applied.

Picture 4:



As a result of hydraulic analysis performed a number of data was received allowing to identify sections with maximum losses on water pipeline route, with the largest possible probability. The principal tasks performed by hydraulic analysis are the following stages:

- Comparison of data received following field testing and survey of water pipeline, with the data of model built. Determining of the ratio of probability of model relevance with actual data under four repair points;
- Analysis of situation given seasonal ratio of irregularity. Determining key indicators of water consumption, pressure on points, velocity, etc.;
- Analysis in the course of removal of leakage from the grid and introduction of water metering discharged for authorized and unauthorized consumers. At this stage, alternative options of connection of customers from other sources to decrease load on water pipeline route were also reviewed.

For the purpose of assessment of model accuracy the results of field works on water flow measurements in four points were used as the basis. Data gained upon model results were compared against field data adopted as the most accurate. The results are demonstrated in Table.

Table 18:Determination of Deviation of Results of Field Testing from Data Received with the Use of Hydraulic Model

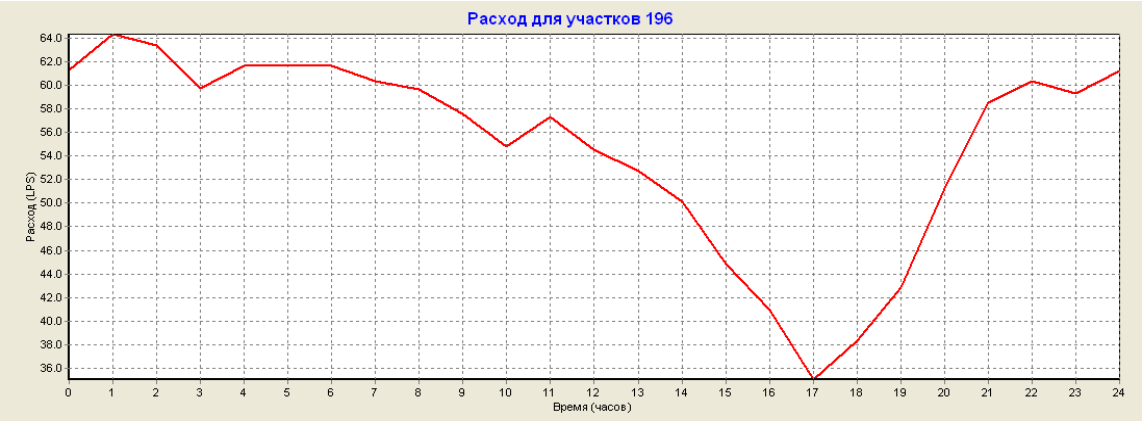
	Point 1			Point 2			Point 3			Point 4		
	Actual Measurements	Model data	Deviaion in %	Actual Measurements	Model data	Deviaion in %	Actual Measurements	Model data	Deviaion in %	Actual Measurements	Model data	Deviaion in %
0-1	299,17	278,35	7,48	272,78	192,24	41,89	161,94	172,94	-6,36	9,17	9,47	-3,20
1-2	298,61	275,00	8,59	270,28	189,93	42,30	160,56	170,86	-6,03	8,89	9,20	-3,38
2-3	297,22	276,06	7,67	270,00	190,66	41,61	159,44	171,52	-7,04	9,17	9,28	-1,22
3-4	298,33	280,09	6,51	269,44	193,44	39,29	159,44	174,02	-8,38	9,72	9,61	1,17
4-5	297,78	277,95	7,13	269,72	191,97	40,50	159,17	172,70	-7,84	9,44	9,43	0,15
5-6	297,78	277,95	7,13	269,72	191,97	40,50	159,17	172,70	-7,84	9,44	9,43	0,15
6-7	297,78	277,95	7,13	269,72	191,97	40,50	159,17	172,70	-7,84	9,44	9,43	0,15
7-8	297,78	279,39	6,58	270,56	192,96	40,21	161,94	173,59	-6,71	9,44	9,55	-1,11
8-9	298,61	280,17	6,58	271,39	193,49	40,26	162,78	174,07	-6,49	9,44	9,61	-1,72
9-10	300,00	282,49	6,20	270,56	195,09	38,68	163,33	175,51	-6,94	9,72	9,80	-0,79
10-11	297,22	285,54	4,09	270,28	197,19	37,06	163,06	177,40	-8,09	10,28	10,04	2,37
11-12	297,78	282,73	5,32	271,67	195,26	39,13	164,44	175,66	-6,38	9,72	9,82	-1,00
12-13	300,83	285,81	5,26	272,22	197,38	37,92	165,00	177,57	-7,08	10,00	10,06	-0,60
13-14	301,39	287,80	4,72	272,78	198,75	37,25	164,44	178,80	-8,03	10,28	10,22	0,57
14-15	301,94	290,64	3,89	273,33	200,71	36,18	165,83	180,57	-8,16	10,56	10,45	1,01
15-16	303,06	296,43	2,24	272,50	204,70	33,12	165,56	184,16	-10,10	11,39	10,91	4,39
16-17	302,50	300,68	0,61	273,33	207,62	31,65	166,11	186,79	-11,07	11,94	11,24	6,27
17-18	303,33	307,16	-1,25	273,06	212,08	28,75	167,22	190,82	-12,37	12,78	11,76	8,65
18-19	303,06	303,52	-0,15	273,89	209,58	30,68	167,50	188,56	-11,17	12,22	11,47	6,56
19-20	302,22	298,66	1,19	273,33	206,23	32,54	166,11	185,54	-10,47	11,67	11,08	5,29
20-21	301,94	289,35	4,35	273,06	199,82	36,65	163,06	179,77	-9,30	10,56	10,34	2,08
21-22	302,22	281,37	7,41	273,61	194,32	40,80	162,22	174,82	-7,21	9,44	9,70	-2,63
22-23	302,50	279,39	8,27	274,17	192,95	42,09	161,67	173,58	-6,86	9,17	9,55	-4,01
23-24	300,00	280,50	6,95	272,78	193,72	40,81	161,94	174,28	-7,08	9,44	9,63	-1,93
Percentage of deviation by section, %			5,16			37,93			-8,12			0,72
Total model accuracy in %			**8,92**									

Statistic deviation of model parameters from actual indicators throughout the system is 8.92% on average. It should be noted that on the section between Points 1-2 deviation was 37.93%. This is due to that insignificant losses along the water pipeline route are observed on this section – about 20-25 l/sec, and as a result, error of actual data is high as compared against hydraulic model data. In general, the model reflects errors less than 10%, and therefore, it may be used as the basis for future analysis.

At the second stage the computation of water consumption was made given seasonal fluctuations. Ratio of annual irregularity of water consumption under normative documents is 1.1-1.3. For this system ratio 1.1 was applied. Taking into account changes in water consumption the computation for winter period was prepared.

Following the computation it is clear that in winter end-user (Shurab City) gets about 45 l/sec. This consumption rate is confirmed by operation services of Public Utility Company of Shurab City.

Picture 5:



Loss reduction along the pipeline route is, first of all, conditioned by the lack of the irrigation needs of residents located along the pipeline route.

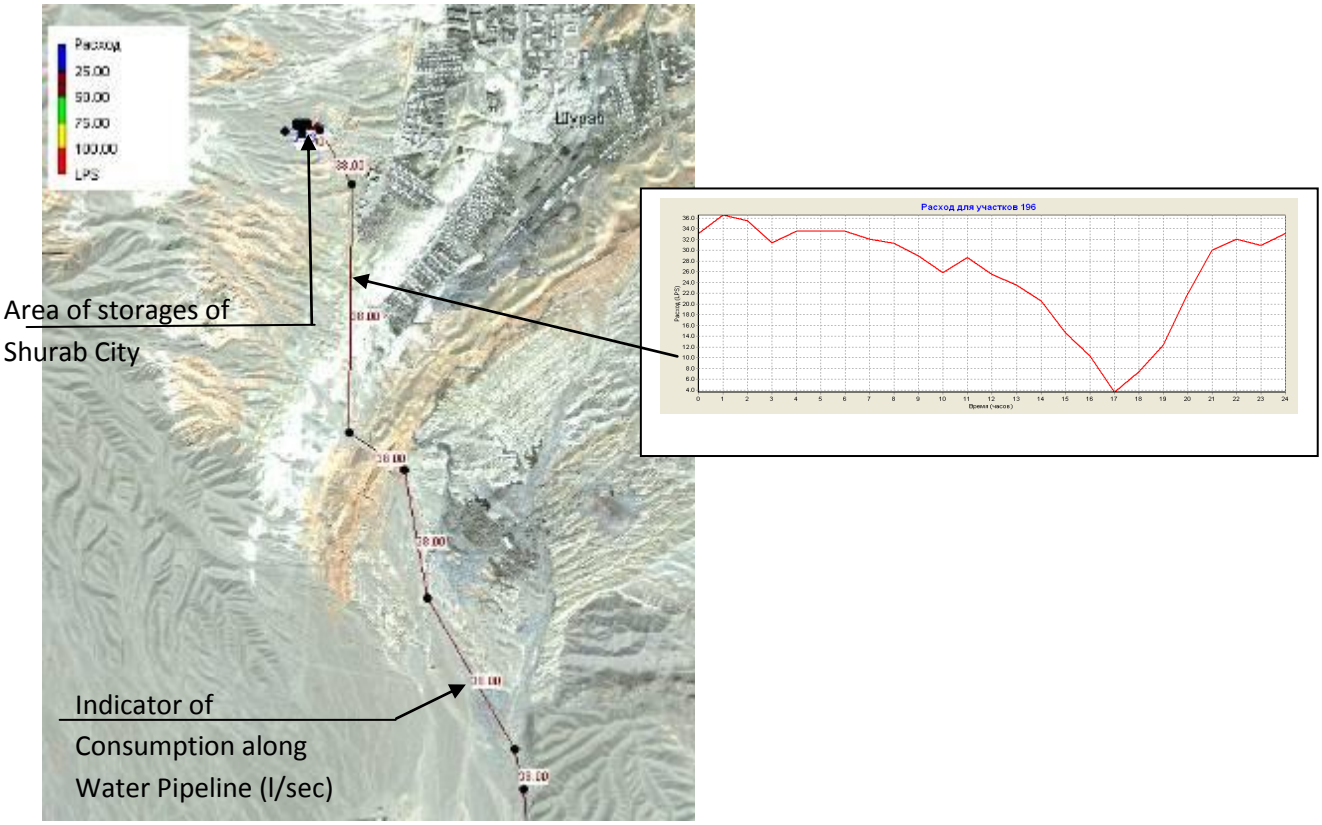
The next stage was to determine certain actions aimed at reduction of water losses along the pipeline route and further inspection of their efficiency with the use of hydraulic model. The actions were undertaken on the basis of preliminary survey and possible alternative options to provide certain villages with own independent water sources.

Suggested Loss Reduction Actions:

1. Removal of existing leakage on pipeline, restoration of shut-off and control valves, cleaning of silted sections of pipeline route and partial replacement of sections in critical condition;
2. Regulation of existing hookups both legal and illegal, including installation of water meter nodes and control of water withdrawal by residents of villages located along WPR “Vorukh-Shurab”;
3. Alternative water supply for villages Ak-Tatyr, Orto-Boz, Jany-Bak, Orto-Sai, Samarkandek, and Pasky-Arykunder ADB Project “Building Infrastructure Services at the Settlements Level”. The water supply source is “Andigen” spring, being in operation.
4. Laying-out new water pipeline route along Vorukh enclave from the water intake facility to the border with Kyrgyzstan. Under this option all hookups on the existing water pipeline would be switched to new water passage. The route length would be 5.6 km.

Key performance indicator of actions is increase in consumption at the final point – Shurab City. At the first stage, the hydraulic model removed six detected leakage on the water passage. The hydraulic computation showed that if such actions are performed, the flow to Shurab City will be increased by 36 l/sec. Hydraulic model data is demonstrated on Picture below.

Picture 6:If Leakage is Removed the Flow to Shurab City will be 36 l/sec or by 25 l/sec more than the current



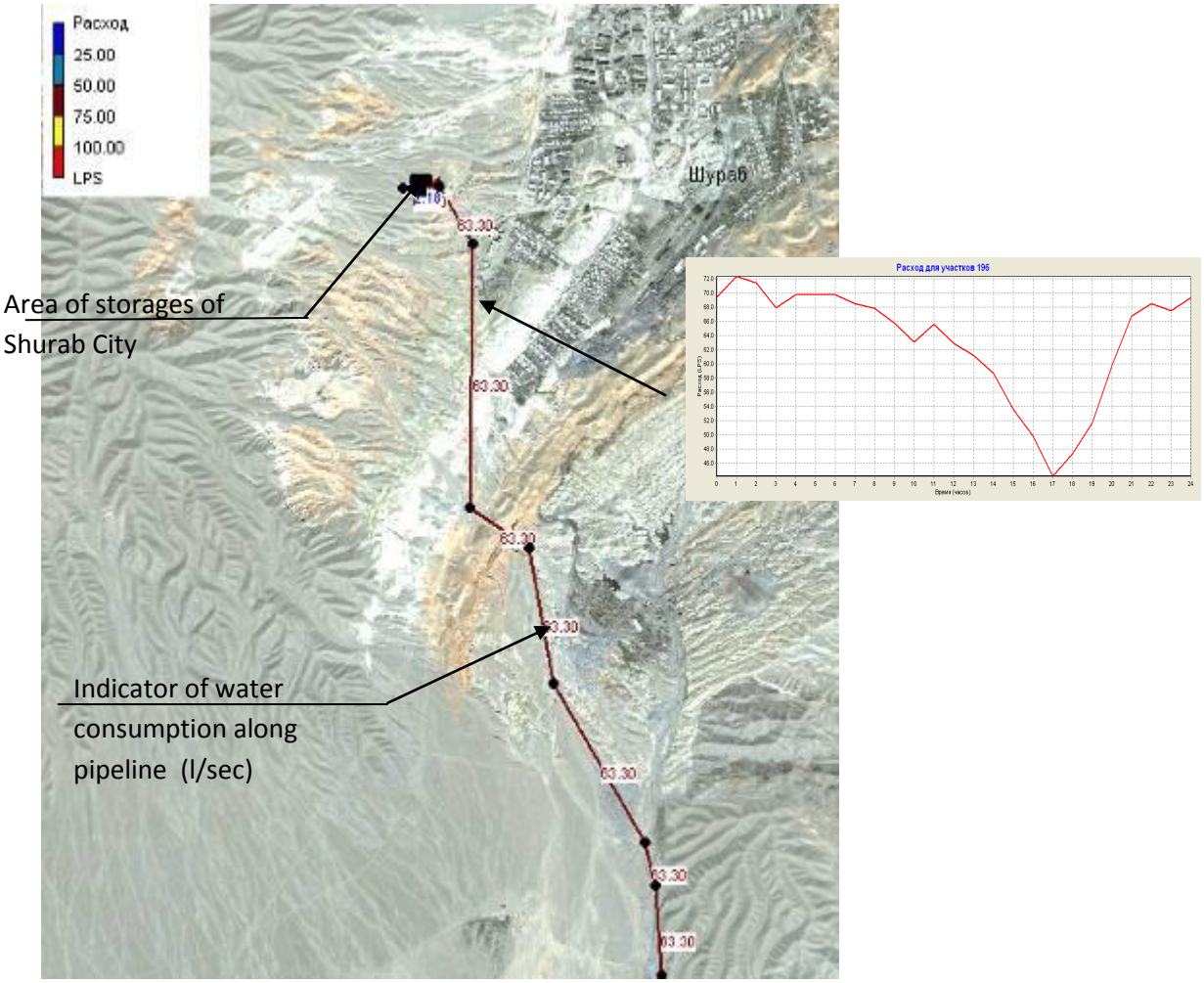
The next stage of hydraulic computation is an option of legalization of unauthorized hookups with installation of water meters nodes and strict water metering. Based on existing norms (SNiP 2.04.02-84) the water consumption norm for household hook-up is 180 liters. Following the data available the computation was made stipulating the above stated norm for one resident. Population number data was used according to the table. Following this computation the base daily water consumption norm was established per one hookup. The number of hookups was derived from the results of preliminary report. The hydraulic model accounts for removal of existing leakage on the water pipeline sections.

This option stipulates the possibility to preserve existing hookups with installation of water meter nodes at the places of connection in special wells. The structure of wells allows getting access to water meter nodes and connect without violation of technical norms.

Computation for this option showed that, in this case, average hourly flow into Shurab City would be 72 l/sec. The advantage of this option is 100% supply of water to connected customers, provided that the water discharge norms are met. In addition, this option allows constant monitoring of the grid with detection of the most critical sections. The deficiencies of this scheme include the following:

1. Possible new unauthorized hookups;
2. Large operation costs to keep water meter nodes in working condition;
3. Considerable capital investments.

Picture 7: Option with Legalization Of Hookups. Water consumption rate per one resident is 180 l/day. Total number of connected residents is 34 thousand. Flow to Shurab City will be 72 l/sec provided that water meters installed and water flow is metered.

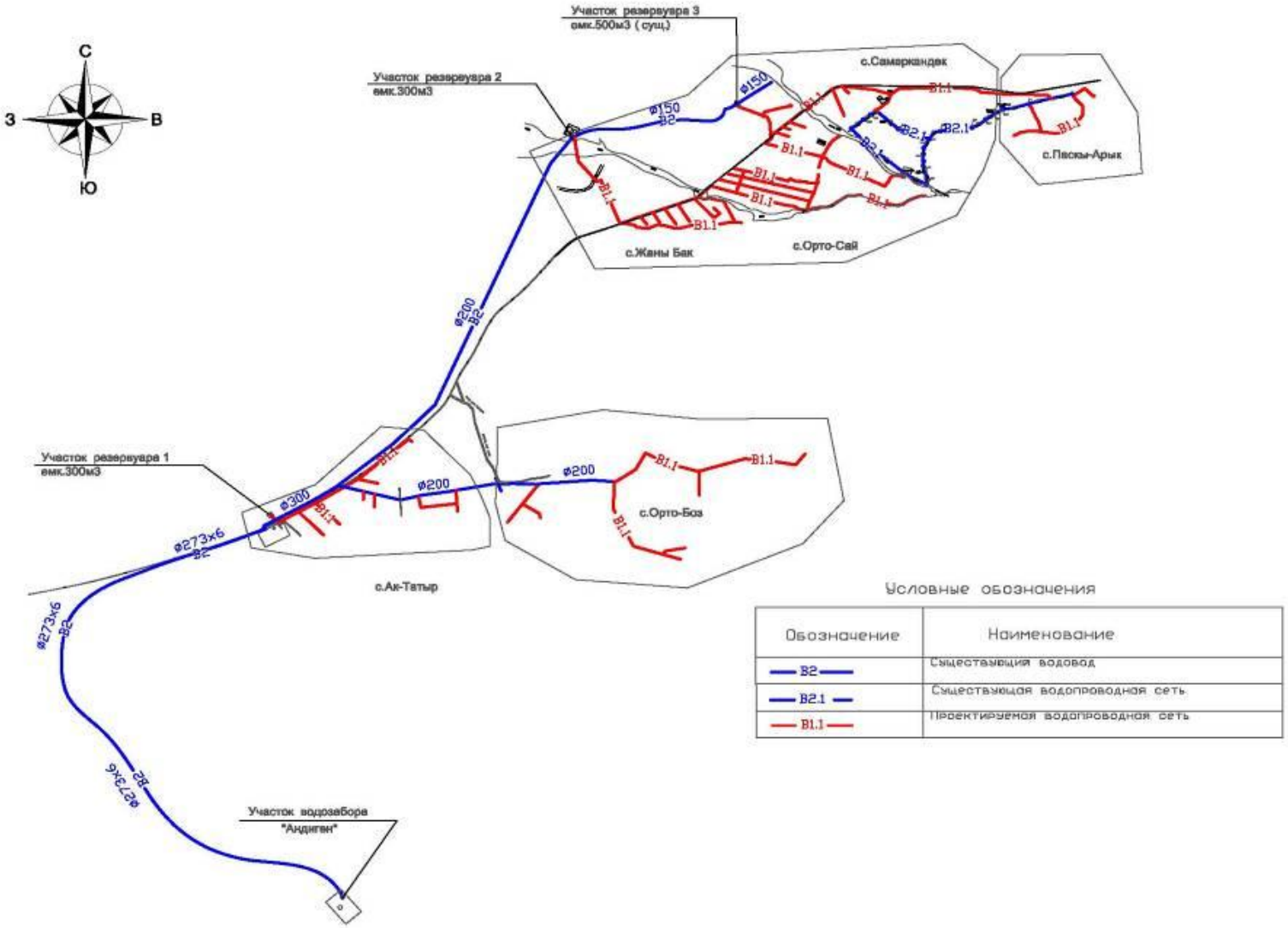


In the process of simulated event an option of provision of some villages with drinking water was examined. It includes villages of Ak-Tatyr, Orto-Boz, Jany-Bak, Orto-Sai, Samarkandek, and Pasky-Aryk. Water supply to these villages was anticipated under ADB Project "Building Infrastructure Services at the Settlements Level". The water supply source is "Andigen" spring in operation.

Currently, design and estimate documentation for this facility has been developed. According to information, ADB suspended funding of these projects. Therefore, initial proposal of OSCE to disconnect villages Ak-Tatyr and Samarkandek from "Vorukh-Shurab" WPR at the expense of connection to Andigen-Suu WSS may be implemented in a long-run prospective.

Examination of implemented project allowed to find out that water withdrawal from Andigen spring was designed for supply of 35 m3/hour. Water supply layout under the project implemented is demonstrated on Picture below.

Drinking water from water intake facility goes along water passage made of steel 325 mm pipes and asbestos-cement pipes of 200-150 mm in diameter to the area of storages. Total length of water passage is 25.8 km. The building of chlorination plant is designed for water disinfection on the area of storages. Then, along existing water channels water goes to the distribution grid of villages.


С
З
В
Ю
Участок резервуара 3
емк.500м3 (сущ.)
Участок резервуара 2
емк.300м3
Участок резервуара 1
емк.300м3
с.Самаркандек
с.Пески-Арык
с.Жаны Бак
с.Орто-Сай
с.Ак-Татыр
с.Орто-Боз
Участок водозабора
"Андижан"
ø150
ø200
ø300
ø273х6
В2
В1.1
В2.1
Условные обозначения
Обозначение
Наименование
Существующий водовод
Существующая водопроводная сеть
Проектируемая водопроводная сеть

When performing hydraulic computations the situation was reviewed in case of implementation of this project. 20% of population of mentioned villages will be supplied with water from "Vorukh-Shurab" WPR and other part of water supply will be carried out from Andigen water intake facility. In this regard, using the Table we assumed provision of 2551 of people from the water pipeline route, at water consumption rate of 180 liters per day.

Table 19: Distribution of Population Sizein Villages of Kyrgyzstan using Drinking Water of "Vorukh-Shurab" WPR and "Andigen-Suu"

#	Village	Village council	Number of residents	Water distribution	
				"Vorukh-Shurab" Water Pipeline Route	"Andigen-Suu" Water pipeline
5	Aktatyr	Aktatyrskaya	3365	20%	80%
6	Ortoboz	Aktatyrskaya	909	20%	80%
7	Jany-Bak	Samarkandekskaya	1896	20%	80%
8	Samarkandek	Samarkandekskaya	5624	20%	80%
9	PaskaAryk	Samarkandekskaya	963	20%	80%
	Total		**12757**	**2551**	**10206**

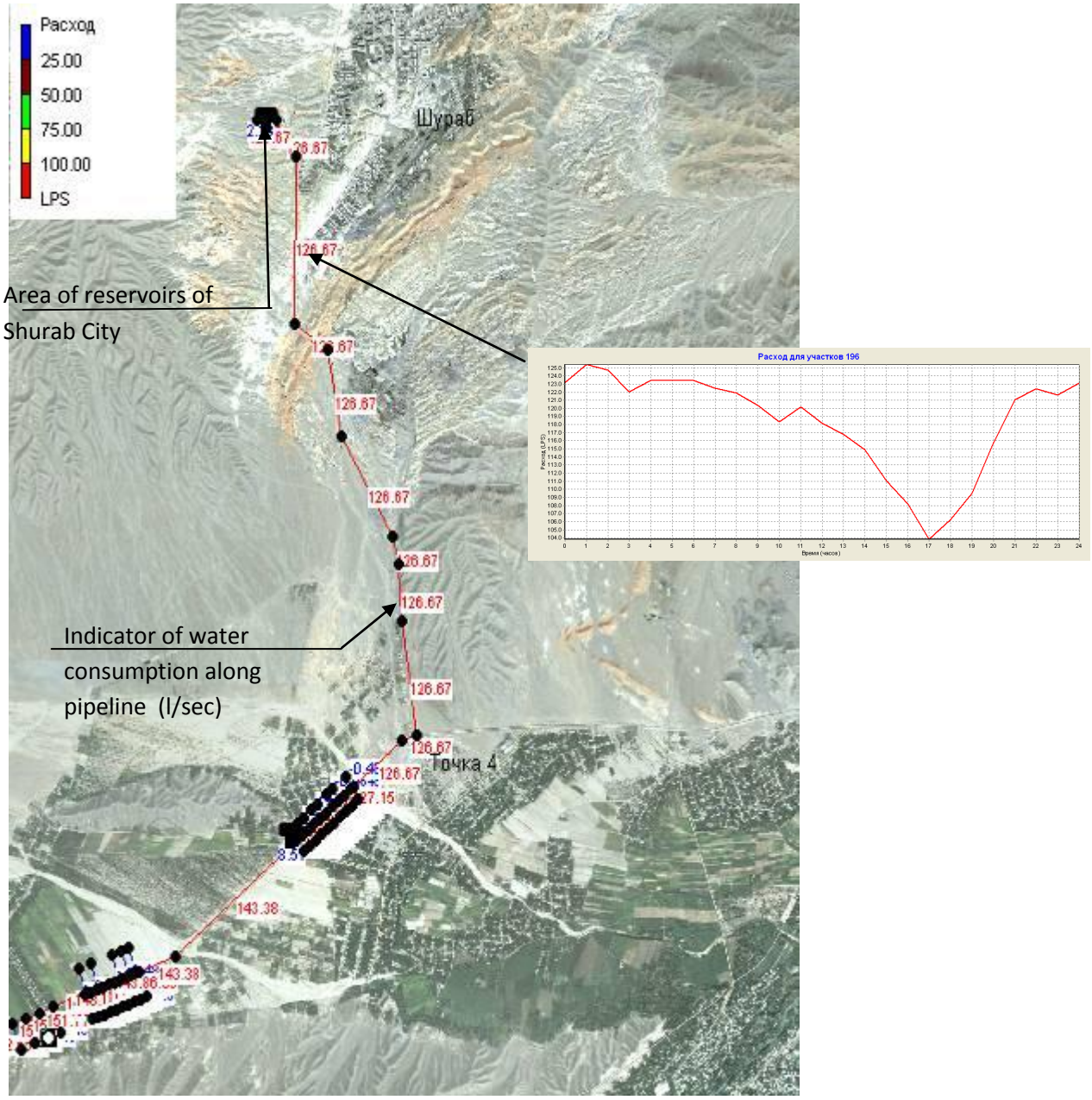
According to this data the computation of required water consumption was made and parameters for hydraulic model were determined.

Table 20: Computation of Water Consumption on the territory of Kyrgyzstan

Estimated Water Flow		2012					Water Consumption			
Item	Rate of Water Consumption per 1 resident, liter	Household size		m3/day	Max quantity	Min quantity	water consumption, m3/hour			
		%	persons				Q max day K=1.2	Q average per hour	Q max.hour	Q min.hour
Population size			2551				551,02	**22,96**	**31,45**	**9,87**
Consumers from hookup to the water passage	180	100%	2551	459,18						
					1,37	0,43				
Owned livestock 20%		20%		91,84						
Unmetered water (20%)		20%		91,84						
Total:				642,85			771,422	**32,14**	**44,04**	**13,82**

Analysis of this situation demonstrated that water flow to Shurab City will be increased by 125 l/sec, that is a very good indicator. It could considerably decrease the load on water passage.

Picture 8: Computation of Water Supply for Shurab City given Switching Vorukh enclave to the New Water Pipeline



We have also considered and simulated a possible loss reduction on existing WPR at the expense of laying out new water pipeline route across Vorukh enclave, from the water intake facility to the border with Kyrgyzstan. Under this option all hookups to existing water passage will be switched to new water pipeline. The route length would be 5.6 km. According to estimates, it will be required to ensure connection of about 11800 people to the new route. It should be noted that additional actions will be needed at the main facility for withdrawal and disinfection of water.

Table 21:Computation of Water Consumption on the territory of Kyrgyzstan

Estimated Water Flow		2012					Water Consumption			
Item	Rate of Water Consumption per 1 resident, liter	Household size		m3/day	Max quantity	Min quantity	water consumption, m3/hour			
		%	persons				Q max day K=1.2	Q average per hour	Q max.hour	Q min.hour
Population size			11800		1,37	0,43	2548,80	**106,20**	**145,49**	**45,67**
Consumers from hookup to the water passage	180	100%	11800	2124,00						
Owned livestock 20%		20%		424,80						
Unmetered water (20%)		20%		424,80						
Total:				2973,60			3568,32	**148,68**	**203,69**	**63,93**

We will determine an estimated diameter of the proposed water passage proceeding from the difference of elevation marks of water intake facility and the last section for connection of water users (data received based on aerial photographs), water passage length, and required consumption. Delivery will be done in gravity mode.

The computation determined the actual discharge capacity of water channel q (l/sec) with known inclination "i". Water channel works in gravity-pressure mode. Therefore, the computation will be done under Shevelev' stables for hydraulic computation of water pipelines.

Based on data acquired from the aerial photograph, the drop of marks from the water intake facility to the most distant connection point is 59.0 m.

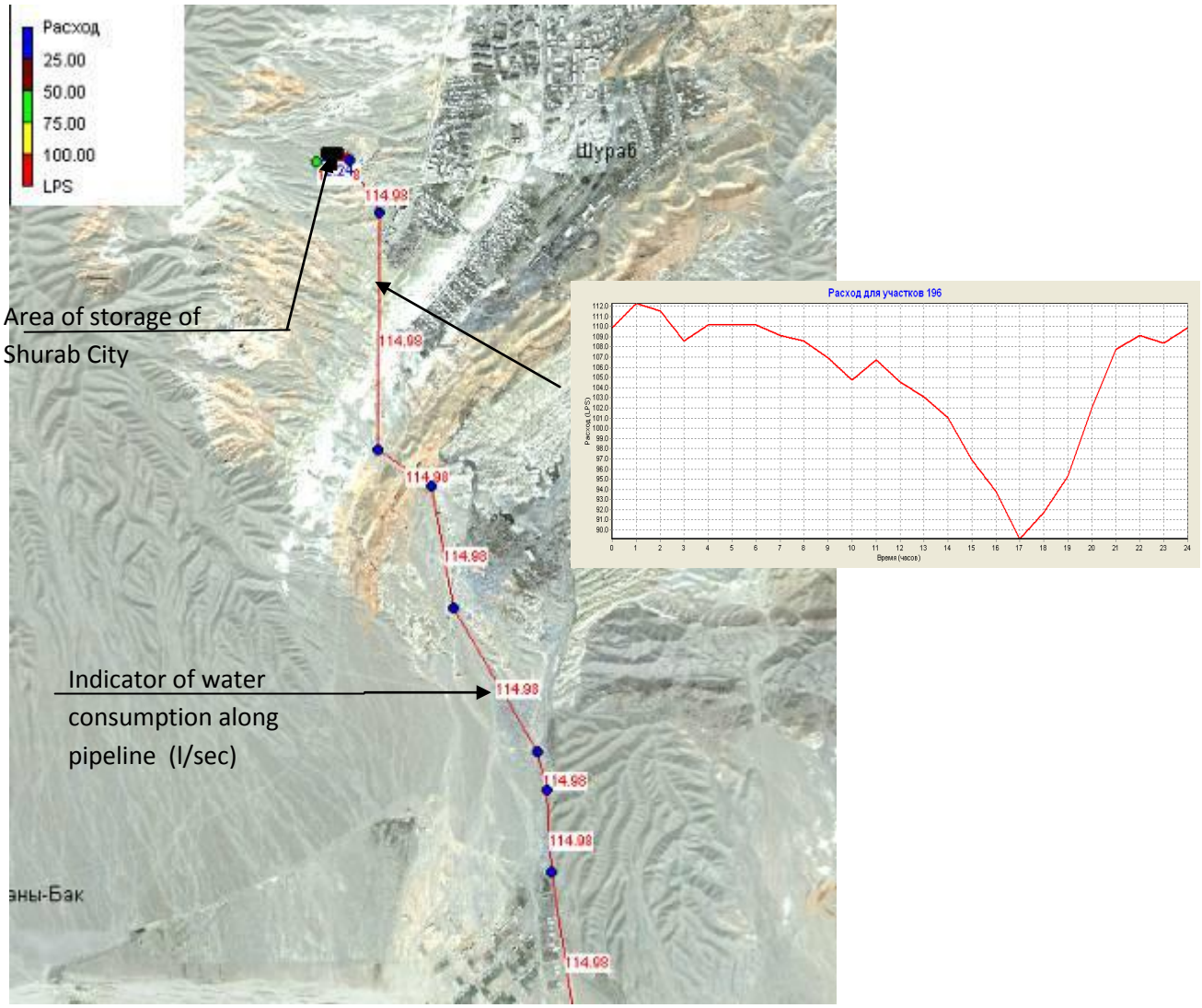
Hgeom = 89,0 м
Average hydraulic slope of placed sections of water passage equals
i = Hgeom / l =89,0 / 5600 = 0,0158x1000=15,89.

With this hydraulic slope for steel pipes under Table II we find the best diameter – 250mm for discharge of 56.58 l/sec or 203.69 m3/h

a) with diameter of section of water channel Dy=250 mm and length of 5,6 km
actual discharge capacity will be q=83 l/sec,
water velocity in pipeline will be v=1,56 m/sec;

Having used the data received we compute in the hydraulic model. The results of these actions will be increase of estimated delivery at the point of end-consumer (Shurab City) up to 112 l/sec. Computation results are given on picture below.

Picture9: Computation of Water Supply of Shurab City Taking Into Account Switching of Vorukh Enclave to New Water Pipeline



This option should consider reconstruction of existing water intake facility. At present, water intake facility located on Vorukh enclave is an outdoor water intake with the direct withdrawal from the river. Water intake facility includes inlet perforated pipe line laid down in the riverbed and two consequent settlings. No water disinfection. Efficiency of current mechanical cleaning is poor. This scheme does not ensure sufficient level of cleaning during floods.

Picture 13: Outdoor water intake facility of from perforated pipes

Picture 14. View of the first settling

Picture 15.View of the second settling

Picture 16. Typical silting of settling

Upon results of survey it was established that:

1. ***Water withdrawal from the river is done outdoor, through perforated pipeline with trash net;***
2. ***Water thaws through two horizontal sequential settlings. At the moment of research, the settlings were strongly silted. Operation of settlings is performed in violation of technological regime;***
3. ***No water disinfection. Existing water intake facilities do not meet sanitary requirements of normative documents for cleaning and supply of drinking water to consumers. It is necessary to undertake actions to clean and restore settlings and disinfect water supplied.***

5.4. Key Findings of Technical Assessment

Based on the technical assessment of "Vorukh-Shurab"WPR the following findings were made:

1. Existing water intake facility located in Vorukh enclave is actually an outdoor water intake facility and it does not ensure water quality for supply of drinking water. Today, it is a water intake facility for supply of technical water. Because it is impossible to perform survey of water intake facility as it is located on the Tajik territory, the full assessment of current situation and technical and economic computation may not be undertaken. The recommendation is to make delisting and filter the source water and perform disinfection.
2. It is necessary to perform capital repair of current water pipeline route, including restoration of sections to be repaired and shut off valves. Silted sections of pipeline should be cleaned to increase discharge capacity. Steel pipeline should be replaced on the sections in critical condition.
3. Water meters should be installed in order to reduce losses on water pipeline route on all hookups (legal and illegal).
4. Consider possibility to implement projects for decrease of load on water passage at the expense of provision of certain villages from other sources (water supply of Ak-Tatyr, Orto-Boz, Jany-Bak, Orto-Sai, Samarkandek, and Pasky-Aryk villages under ADB Project "Building of Infrastructure Services at the Settlements Level").
5. Consider a possibility to fund water supply for Vorukh enclave by construction of an additional water pipeline and connecting all customers to the new water pipeline.