

CENTRAL ASIA'S HYDROPOWER PROBLEMS: REGIONAL STATES' POLICY AND DEVELOPMENT PROSPECTS

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Introduction

Water in Central Asia has always been not only a source of life, but also a source of disputes. This is because the region has been agricultural from time immemorial and rice and cotton, which require a lot of irrigating, are its main crops. But most of the region is extremely arid; water evaporation in Central Asia is higher than in similar regions of the world. This, in turn, is the reason for the insufficient drainage density. In the expanses of Central Asia's desert lowlands, the drainage density amounts to 2 m per 1 sq. km, whereas the same index in the northern part of the Russian lowlands amounts to 300-350 m per 1 sq. km.

Another important feature of Central Asia is that the amount of precipitation and, conse-

quently, the runoff perceptibly increases only in the highlands. So the main water resources are controlled by mountainous Kyrgyzstan and Tajikistan; these countries account for a total of 80.7% of the entire region's runoff. Both republics use river water to generate electricity for export and for domestic consumption, while Kazakhstan and Uzbekistan use it only for irrigation purposes. In this scenario, Tajikistan and Kyrgyzstan increase water discharge in the cold winter months in order to engage the hydropower plants during increased electricity consumption and reduce it in the summer in order to replenish the amount of water in the reservoirs, again with the aim of engaging hydropower capacities during the winter. But this leads to waterlogging of

Kazakh and Uzbek territory in the winter and a shortage of irrigation and drinking water in the summer. This strikes a hard blow at the economy: according to some experts, the Central Asian countries incur up to \$770 million in economic losses from the submergence of farm land in the winter and water shortages in the summer.¹

In the former Soviet Union, attempts were made to resolve this problem by creating a Joint Energy System responsible for controlling and ensuring the rational use of river runoff, as well as for distributing electricity in a way that avoided grid overload. This goal was reached by means of energy exchange: Kazakhstan and Uzbekistan delivered gas, coal, and petroleum products to Kyrgyzstan and Tajikistan, while the latter, in turn, discharged water during the vegetation periods and supplied electricity. This streamlined energy exchange consolidated the countries. But when the Soviet Union collapsed and the economic ties broke down, the region's countries were left to resolve their hydropower problems on their own.

In 1998, the independent Central Asian countries tried to tackle the issue on the basis of a

framework agreement among Kazakhstan, Uzbekistan, Kyrgyzstan, and Tajikistan on the joint and comprehensive use of the hydropower resources of the Naryn and Syr Darya reservoirs and the Toktogul hydro system.

It should be noted that use of the shared water resources in Central Asia today is becoming a political rather than an economic issue. Common integration mechanisms are needed, the first of which should be an effective agreement on water and energy.² In turn, integration will help to consolidate efforts to improve the socioeconomic situation in the region's states, create a large integrated market of 50 million people, as well as free trade areas, raise the efficiency of mutual investments, and ensure coordinated foreign policy actions.

This means that the CA countries are extremely interdependent on each other regarding water use issues. It should also be kept in mind that water shortage in the region will become even more acute in the future due to population growth, the development of industrial and agricultural production, and the increase in arable land.³

² See: K. Smagulov, "Obyedinenie vodoi i svetom," *Vox Populi* (Almaty), No. 2, 2008.

³ See: *Vodnoenergeticheskie resursy Tsentral'noi Azii: problemy ispolzovaniia i osvoeniia*, Branch Review of the Eurasian Bank of Development, Almaty, 2008, p. 4.

¹ See: V. Paramonov, "Vodnoenergeticheskaia problema Tsentral'noi Azii i politika Rossii," available at [<http://www.sfu-kras.ru/node/6759>], 21 February, 2011.

Water—A Dwindling Resource

According to U.N. experts, the age of cheap food is behind us. This means that there will be growing competition throughout the world for food products and the dwindling sources of their production. In Central Asia, this has been a signal to step up the fight for control over the region's water resources. The results of fixed surveillance and the numerous scientific studies confirming changes in climate can be added to this factor.

Thanks to the data published in the hydrological yearbooks of the main hydrometeorological services, the average arithmetical amount of total runoff for the basin of the Aral Sea throughout the period of observations (1911-2000) constitutes 112.609 cubic km/year, of which the basin of the Amu Darya river accounts for 77.093 cubic km/year and the basin of the Syr Darya river for 34.076 cubic km/year.⁴ An assessment of the long-term annual average runoff clearly distinguishes three 19-year

⁴ See: "Poverkhnostnye vody," available at [http://www.cawater-info.net/bk/water_land_resources_use/docs/water_res.html], 21 February, 2011.

cycles, beginning with 1934 and ending in 1992 in the Amu Darya river basin, and six 12-year cycles, beginning with 1928 and ending in 1997 on the Syr Darya river. The amount of long-time average annual runoff recommended by the Scientific-Information Center of the Interstate Commission for Water Coordination (ICWC) of Central Asia is 79.280 cubic km/year for the basin of the Amu Darya river and 37.203 cubic km/year for the basin of the Syr Darya river.⁵ As a result of the fluctuations in water content, the annual water resource indices vacillate between low-water and high-water years within the following ranges: between 58.6 cubic km and 109.9 cubic km for the Amu Darya and between 23.6 cubic km and 51.1 cubic km for the Syr Darya.

Last century, an unfavorable environmental situation developed caused by extreme runoff withdrawal in the river basins. For example, the entire Aral region was declared an environmental disaster zone since runoff withdrawal in the Amu Darya and Syr Darya rivers basins feeding it exceeded 90% of the annual runoff. According to world data, whereas between 1900 and 1950, the average increase in water consumption per decade amounted to 156 cubic km, between 1950 and 1960, it had risen to 630 cubic km, that is, a four-fold increase, and in subsequent years it grew by another 800-1,000 cubic km per decade.

The climatic warming trend caused a steady shrinking of glaciers. According to the forecasts, by 2025, the glacier area in Kyrgyzstan will shrink by 30-40%, which will lead to a decrease in water content of 25-35%.⁶ According to the data of the Hydroelectric Engineering Institute of the Kyrgyzstan National Academy of Sciences, glaciers are currently receding three times faster than they did in the 1950s. According to some studies, glaciers are receding at 50 m a year. If this rate keeps up, Kyrgyzstan will lose all of its small glaciers and be left with only a few large ones. Glacier melting and, consequently, local river runoff will peak around the 2020s-2030s, thus resulting in a decrease in runoff volume of 40%. If the glaciers continue to melt as rapidly as they are at present, in approximately 20 years, Central Asia will find itself on the brink of an environmental disaster.

When the Toktogul hydropower station with its 215-meter reinforced concrete dam was built last century, a reservoir of long-term regulation was formed with a water volume of 19.5 billion cubic meters. This made it possible to significantly increase the water supply for consumers in the basin of the Syr Darya river, enlarge the area of irrigated land in Kazakhstan and Uzbekistan by 400,000 hectares, and raise the amount of irrigation water for an area of 918,000 hectares from 70% to 90%. But the melting glaciers and the resultant drop in the level of river runoff could have a catastrophic effect on farming activity in Kazakhstan and Uzbekistan.

Risks

As current reality shows, neither Kyrgyzstan nor Tajikistan are capable of independently building such large facilities as the Kambar-Ata and Rogun hydropower stations. The reasons for this include the weakness of these states, the absence of permanent and long-term funding, the shortage of qualified personnel and experience, and the rigorous opposition by neighboring countries. Nor are foreign investors in any rush to pump money into them, being justifiably deterred by the unstable political situation, high level of corruption, and investment risks.

The Kambar-Ata-2 project, for example, shows that a generating station that will meet all the security and environmental requirements, as well as ensure a return on investment, cannot be built and

⁵ See: Official website of the Scientific-Information Center of the Interstate Commission for Water Coordination of Central Asia [<http://sic.icwc-aral.uz/>], 21 February, 2011.

⁶ See: Situational analysis, available at [http://gef.undp.kg/main1_r.html], 21 February, 2011.

put into operation in the current conditions. This is graphically shown by the following statistics: the estimated cost of construction work amounted to \$270 million; more than \$200 million was spent on building the first generating unit, \$26 million of which was stolen, which naturally had an effect on the quality. There is also evidence that blasting and building work was not carried out at a sufficiently high level, which is fraught with a halt in the operation of the hydropower station.

According to the technological specifications, Kamar-Ata-2 will have to be built after or at the same time as Kamar-Ata-1, since there is the risk of it quickly becoming incapacitated due to silting. In turn, Kamar-Ata-1, with an installed capacity of 1,900 MW and estimated cost of \$1.7 billion, is the largest facility in the entire Kamar-Ata hydropower station complex. According to the project, the dam will be built by means of controlled blasting, which could lead to a change in the structure of the earth's crust.

The risk of an environmental disaster, floods, and drop in water level threatens to significantly worsen relations between Kyrgyzstan and Tajikistan, on the one hand, and Kazakhstan and Uzbekistan, on the other. Whereas Uzbekistan may still be able to compensate water losses in the vegetation period, Kazakhstan will essentially receive no irrigation water. Taking into account China's increased water withdrawal from the Irtysh and Ili rivers, which could lead to the Balkhash and Zaysan lakes drying up, the decrease in discharge from the Syr Darya river will be extremely detrimental to Kazakhstan.

Today, it is becoming more or less clear that the problems are mainly caused by inefficient and corrupt management. A negative role is also played by the unwillingness of the governments of the neighboring states to understand the designation of the Toktogul reservoir: it was built in Soviet years as part of single regional complex, and the money spent on its operation was compensated for in the form of deliveries of alternative energy resources. This creates a whole chain of interrelated problems. But each country is pursuing its own national interests, so the only solution is to find a compromise, each side must make concessions.

Political Maneuvers of the Regional States

The buildup in tension in relations between Uzbekistan, on the one hand, and Tajikistan and Kyrgyzstan, on the other, led to Tashkent officially announcing on 1 December, 2009 that it was withdrawing from the Central Asia Joint Energy System (JES), which Turkmenistan also withdrew from in 2003. This led to a halt in electricity supply (1.2 billion kWh) to Tajikistan from Turkmenistan via Uzbekistan's power transmission lines, thus placing Tajikistan in complete energy isolation. In addition, approximately one third of the energy consumers in Kyrgyzstan also found themselves in complete electricity isolation. It is also worth noting that throughout the years of its independence Uzbekistan has been deliberately conducting a policy aimed at forming its own energy security. For example, in 2009, a 500-kV power transmission line was put into operation between the Guzar and Surkhan substations, which made it possible to deliver electricity directly to the Surkhandarya Region, bypassing Tajikistan, and increase the export of Uzbek electricity to Afghanistan to 300 MW. In the future, Uzbekistan plans to draw \$3.5 billion in investments into the energy industry.⁷

⁷ See: "Uzbekistan Plans to Draw \$3.5 Billion in Investments into the Energy Industry," available at [<http://www.fergananews.com/news.php?id=13410>], 21 February, 2011.

However, it must be noted that right before Uzbekistan withdrew from the JES, Ambassador of Uzbekistan to Tajikistan Shoislam Shokasymov told the Tajik authorities that Tashkent was willing to continue cooperating with Dushanbe in the energy sphere on the basis of bilateral intergovernmental agreements. So it is obvious that Uzbekistan is not striving toward integration, but is pursuing bilateral relations with its neighbors. Some experts say that this is because the integration unions want to delegate sovereignty to supranational structures, but Islam Karimov, Uzbekistan's current president, is against this. Suffice it to recall Tashkent's unwillingness to participate in the CAC and its withdrawal from the EurAsEC. Another reason is the rivalry between Uzbekistan and Kazakhstan for leadership in Central Asia, which boils down to personal rivalry between Islam Karimov and Nursultan Nazarbaev. It is obvious that if an integration union is created, Kazakhstan, which is economically more powerful than Uzbekistan, will play the leading role.

Immediately following Uzbekistan's withdrawal from the JES, Kazakh diplomacy stepped up its activity to create an energy ring around Uzbekistan. For example, an agreement was reached on establishing a joint energy system with Kyrgyzstan, which was later joined by Tajikistan. Kazakhstan announced that it would build the Kemin (Kyrgyzstan)-Almaty power transmission line costing a total of \$140 million. A protocol was signed between the governments of Kazakhstan and Kyrgyzstan on building a high-voltage power transmission line from Kyrgyzstan to Kazakhstan,⁸ which envisages 30 June, 2012 as the date for completing the feasibility report. At the same time, the government of Kazakhstan began discussing the construction of a new coordinating dispatch center called Energia II in Almaty, in counterbalance to Tashkent's Energia Coordinating Dispatch Center.⁹ A closer look at these decisions shows that building the Datka substation not far from Jalal-Abad (Kyrgyzstan) will make it possible to send it all the electricity directly from the Kurpsai, Tashkumyr, Shamaldy-Sai, and Uch-Kurgan generating units in the lower cascade of the hydropower station without going through Uzbekistan.¹⁰ Bishkek also signed an agreement with China on the Datka-Kemin project, according to which a 500-kW power line will go from the Datka substation through Kamar-Ata-2 and Kamar-Ata-1 in the direction of the Naryn Region to the Kemin substation, thus improving electricity supply to the north of Kyrgyzstan. The Kazakh side, in turn, has joined these projects and is funding the construction of the Kemin-Almaty power transmission line, while Tajikistan is planning to build a line from Datka to Khujand with access to Afghanistan. In this grid, the energy systems of Tajikistan, Kyrgyzstan, and Kazakhstan will operate in coordination with UES Russia, with the Energia II Coordinating Dispatch Center in Almaty being responsible for dispatching electricity and capacity interchange.

According to Senior Researcher of the Institute of International Studies of the Moscow State Institute of International Relations of the Russian Foreign Ministry L. Gusev, creating a new Central Asian energy system is advantageous for Tajikistan since it reduces the country's dependence on Uzbekistan. This is keeping in mind that the South-North power transmission line joining the northern and southern parts of Tajikistan and bypassing Uzbekistan was put into operation in 2009.¹¹

The Kazakhstan government has also been engaged in discussing the possibility of putting a thermal power plant into operation on the rich Kyrgyz coal deposit of Kara-Keche, the proven reserves

⁸ The Kyrgyzstan Ministry of Energy, NES Kyrgyzstana Open Joint-Stock Company, the Kazakhstan Ministry of Industry and New Technologies, and KEGOC Joint-Stock Company discuss building a 500-kV power transmission line at a meeting of Kyrgyz and Kazakh working groups to examine bilateral cooperation issues and render assistance to Kyrgyzstan, 14 July, 2010 (see: [<http://www.akipress.kg>], 21 February, 2011).

⁹ See: Report by A.M. Satkaliev, President of KEGOC Joint-Stock Company, called *Aspects of International Cooperation in Developing the Main Infrastructure of the Energy Complex* (see: [<http://www.kazenergy.com>], 21 February, 2011).

¹⁰ See: "LEP Datka-Kemin obespechit elektroenergiei sever Kyrgyzstana," available at [<http://www.tokmak.kg/nevkg/akonomkg/5458-lyep-datka-kemin-obespechit-yelektroyenergiej.html>], 21 February, 2011.

¹¹ See: V. Zhavoronkova, "Obyedinennaya energosistema v Tsentral'noi Azii vygodna dlia Tadjikistana—ekspert Leonid Gusev," available at [<http://ru.trend.az/print/1640529.html>], 21 February, 2011.

of which are estimated at around 4 billion tons.¹² Construction of this facility, with an estimated capacity of 1,200 MW and prospective increase of up to 2,400 MW, will be completed within four years. Moreover, this plant will make it possible to alleviate operation of the cascade of the Toktogul hydropower station in the winter in order to accumulate water and ensure its more rational use in the spring-summer period. This will have a favorable effect on the water supply and help to eliminate the electricity shortage in the southern regions of Kazakhstan.

However, Astana is more interested in the possibility of creating, by participating in building the Kara-Keche thermal power plant and by building power transmission lines from the Toktogul hydropower station through the Kara-Keche thermal power plant to Issyk-Kul, the new Central Asian energy ring, which will be coordinated by the Energia II Coordinating Dispatch Center in Almaty. Kazakhstan has already completed the construction of the Koksarai Counter-Regulator and is planning to build an automated water supply complex in the Kazakh section of the Dostyk canal, whereby resolving at least two problems at once. First, it will be able to save the population settlements in the Syr Darya basin from flooding and, second, it can independently control the discharge of water from the Shardara hydropower station along the Dostyk canal. This will raise the generation of electricity and make it possible to increase the amount of arable land, consequently improving food safety.

External Players

Despite Astana's strivings, it should be understood that not one of the leading powers with interests in Central Asia (Russia, China, the U.S., and Iran) wants the region's countries to integrate. The current isolation of the region's countries, not to mention the growing contradictions among them, is precisely what the external players need to advance their long-term strategic interests in Central Asia. For example, the U.S. is actively promoting the CASA-1000 (Central Asia-South Asia) project, the objective of which is to create a system for transmitting electricity from Kyrgyzstan and Tajikistan to Afghanistan and Pakistan.¹³ Moreover, Afghanistan will gain a secondary advantage from charging for the transit of energy exported to Pakistan.¹⁴ By implementing this project, Washington is trying to resolve three problems at once: prevent the Central Asian countries from integrating; replenish the Afghan budget by means of energy transit through Afghanistan, which will provide it with more money for making the transition to a peaceful lifestyle; and increase energy deliveries to Pakistan. Russia is striving to integrate the CA countries by means of the EurAsEC, CIS, and CSTO under its own aegis. China, which is against the establishment of a large Muslim integration union in the direct proximity of its borders, is trying to conduct its policy through the SCO. At the same time, Beijing is trying to prevent the CA countries from uniting by participating in the resolution of hydropower issues, thus also resolving its own domestic problems. In particular, China is participating in the construction of small hydropower plants in Kyrgyzstan in order to supply its western provinces with electricity, while also building railroads and highways to Kyrgyzstan along the power transmission lines, in so doing binding Bishkek to it.

¹² See: E. Karybekov, N. Doskali, *Novaia model Obyedinennoi energosistemy Tsentral'noi Azii. Monografiia*, Almaty, 2009, p. 31.

¹³ See: Z. Ergasheva, "Tajikistan has Lost \$150 Million due to Redundant Discharge of Water from the Nurek Reservoir," available at [<http://news.tj/ru/news/tadzhikistan-iz-za-kholostogo-sbrosa-vody-iz-nurekskogo-vodokhranilishch-poteryal-150-mln>], 21 February, 2011.

¹⁴ See: "Blake oboznachil priorityty Administratsii SShA v Iuzhnoi i Tsentral'noi Azii," Speech by U.S. Assistant Secretary of State Robert O. Blake, Jr., Rice University, 19 January, 2011, Houston, Texas, available at [<http://www.12.uz/ru/news/show/comments/5601/>], 21 February, 2011.

Between 2006 and 2009, China assisted in building two power transmission lines in Tajikistan—PTL-100 and PTL-500, which connect the country to China's electric power system. After withdrawing from the JES in 2003, Turkmenistan's energy system has been operating in conjunction with Iran's energy system. However, joint operation of the energy systems of the CA states and external countries is leading to the greater dependence of the former on the latter, since this provides the external players with levers of pressure on Central Asia.

In Lieu of a Conclusion

Since the interests of the regional countries are at variance, which the external players are encouraging, there can be no talk of their integration and a common solution to the hydropower problems.

Kyrgyzstan and Tajikistan will most likely continue their unsuccessful attempts to build large hydropower plants and charge the other regional countries for water. Uzbekistan, in turn, will try to block such initiatives in every way it can, including via multilateral structures.

Kazakhstan's steps will be instrumental in the development of this situation. For example, if Astana takes Uzbekistan's side, this will increase the isolation of the regional countries in water use issues and the development of the energy industry. If, however, it takes the side of Kyrgyzstan and Tajikistan, keeping in mind Russia's interest in building hydropower plants, Kazakhstan has every chance of becoming a key participant and moderator in the management of water resources in Central Asia. It could create a hydropower ring around Uzbekistan, that is, Astana could gain a lever of pressure on Tashkent, which, if used sensibly, could promote the creation of an integration union of the Central Asian countries.
