

WATER GEOPOLITICS IN CENTRAL ASIA. Case Study - Future Implications of Rogun Hydropower Plant

Aura Carmen Slate

Energy Center Romania
slate.acarmen@yahoo.com

Abstract

Trans-boundary water resources emerge in considerable interstate challenges, as it is the case of Central Asian countries, revealing the uttermost importance of water in all its complex economic, political, environmental and human security dimensions. Albeit being under international law regulations, water scarcity is prone to aggravate regional disputes under defective management and cooperation. Hereupon the thesis of the study is that unequal distribution of water and large hydro infrastructure projects built on trans-boundary waters lead to an increased potential of interstate conflicts. Competition for water will only sharpen in the region as foreseen due to the growing population, the expansion of irrigation and the industrial development. The enforcement of the legal framework proved to be dysfunctional thus far, unless a determined political will and a close cooperation with the international bodies envisage a water management system and an effective use of water resources for energy generation and long term investment in energy projects.

Keywords: water and energy nexus, trans-boundary water resources, Rogun Hydropower Plant.

Introduction

Water geopolitics has been intensively debated over the past years on account of critical situations encountered in particular regions. One such region is Central Asia. Water is vital for human development and security, consequently the coordination of trans-boundary water resources for a rational utilisation, a complex issue regulated by strict international law, emerges as another major controversial issue to be discussed in the following pages. The Rogun Dam, built on a river flow which is part of a trans-national water basin, in a region that constantly faces water scarcity due to human-induced activities like intensive irrigation, industrial pollution, or natural phenomena such as droughts and flooding, led to the escalation of Tajikistan - Uzbekistan relationship over the past decades.

Water confirmed its feature as a national asset, especially in Central Asian. In this region water scarcity is affecting both the agriculture and the economic safety of the downstream countries which is tightly bound to the

water management models of the upstream countries in their hydro electricity generation activities. For that reason, the research objective of this present paper is to analyse the implications of the unequal distribution of water resources among two neighbouring countries in Central Asia, namely Tajikistan and Uzbekistan, in aspects that derive from domestic purposes, agricultural and electricity needs in the context of Rogun hydropower plant construction (*hereafter* Rogun HPP). The answers this paper seeks are: how does the study of water geopolitics develop in the water and energy nexus of the Rogun HPP? Water and energy nexus of Rogun HPP exceeds the traditional use of water, and in this particular case, the cornucopia of water resources is linked to the energy security of Tajikistan and the agricultural security of Uzbekistan. What intermediate and long-term implication has water, a valuable commodity, on Tajik – Uzbek relations that reached an unprecedented impasse lately, on their economies, on the energy security paradigm? And how does electricity generation infrastructure built on trans-boundary water courses trigger the translation from *water as a common value* to *water as a national asset*?

The methodology used in the present research paper is the case study approach of Rogun HPP in the light of Tajik – Uzbek relations much affected by the water resources tensions. Ergo water management has become over the last decade a stringent topic debated in international fora. This explains the motivation to choose Rogun HPP as a case study connected to the special features of the region and its relevance to the international trans-boundary water law practices. The study case structure chosen in the present paper is approached from a descriptive and predictive perspective. Since the case study approach encounters methodological problems, among which the case-selection bias (Kacowicz 2002), several explanations are much needed at this point. The Rogun HPP case was selected because it is part of the water geopolitics complex of the Central Asian region. Moreover, Rogun HPP is an example of hydro infrastructure built on a trans-boundary water course in a region that already faces water insecurities, where water stress living conditions have been constantly reported.

In the first stage of the paper the focus is placed on the water and energy nexus in the Rogun HPP context, then I proceed with an analysis regarding the economic, ecological and human security implications of such a large-scale hydro project. The last stage of the paper is reserved for discussing the possible escalation to a military conflict even after the completion of Rogun HPP, and an analysis of a possible Tajik paradox, which I defined based on *the resource curse* literature. It refers to the great hydro potential that

Tajikistan has, and its innumerable difficulties in finding ways to develop this particular potential, ranking as the poorest country in Central Asia.

For a better understanding, a succinct description of Central Asia's geographical framework is required. States, which are part of the Central Asia cluster, are the so-called landlocked countries. This term defines a country entirely enclosed by land or with coastlines on closed seas. Tajikistan and Uzbekistan are part of this cluster. Central Asian region is crossed by large rivers, like Amu Darya (in the South), Syr Darya (in the North), flowing East-West, and large bodies of water like Aral Sea. Amu Darya, which basin is supposed to provide as a water supply for the Rogun HPP, has the largest water flow in Central Asia with a catchment area of 309000 km² and a length of 2540 km, flowing through Afghanistan, Kyrgyzstan, Tajikistan, Turkmenistan and Uzbekistan into the Aral Sea. According to the water flow direction, one can identify two types of countries in the Central Asian geographical framework: the upstream countries, namely Tajikistan and Kyrgyzstan, and the downstream oil and gas-rich states of Kazakhstan, Uzbekistan and Turkmenistan.

Note that Rogun HPP is a large-scale electricity generation project built with international financial assistance on the tributary river of Amu Darya, the Vakhsh River. Rogun HPP is seen as a potential danger for downstream state of Uzbekistan, which is dependent on Amu Darya's water flow in irrigations during summer months. However, the hydropower plant is thought of being the key answer of the Tajik economy, since it will produce electricity expected to meet the domestic and industrial needs, but also to increase governmental revenue through electricity exports once the HPP enters in full operational mode.

Other natural features consist of Tajikistan's continental climate zone, from semiarid to polar in the mountains. Due to climate change, it is foreseen that water flow in the major river basins will decrease by an average of 7% by 2050 with effect on hydroelectric power production (Philander 2008, 947). Uzbekistan, one of the world's two doubly-landlocked countries, is being totally surrounded by other landlocked countries. The soil of a low quality for agricultural purposes requires intensive irrigation as the terrain is mostly desert, while only 10% of the land is lying in fertile river valleys. Instead, poor conservation practices and the legacy of the Soviet era, already caused enormous environmental damage, and experts believe that

this damage will exacerbate the effects in coming years (Philander 2008, 1052).

The ecosystem of the region is highly influenced by the Aral Sea, described as one of modern history's great environmental disasters. During the Soviet era, massive amounts of water were diverted to irrigate crops, both from the Aral itself and from its feeder rivers, Amu Darya, Syr Darya. Over the last two decades, 90% of the lake's source flow has dried up. Its surface area has decreased by 50-60%, and it has lost 80% of its volume. Therefore harmful ecological consequences are expected to emerge soon, foreseen as predispositions to conflict escalation. Less water from precipitations means less crops and increased desertification of the region. Moreover, effects of drought are accruing, as well those of increased salinity of water due to intensive irrigation practices. Seasonal flooding affects human health and safety as floodwaters recede, injuries are joined by a great risk of disease from contamination of drinking water tainted by raw sewage or pollutants (Philander 2008, 411).

The study will focus on intermediate and long-term economic, ecological and human security implications. The following aspects illustrate the scientific contribution of the paper: it builds an analysis of a water and energy nexus in the Rogun HPP context; it highlights the existence of a more strategy oriented debate in the international arena, on one hand, and the emergence of scientific literature on the region's complex background taking into account the scarcity of water resources, on the other hand. Both have developed recently as a consequence of Rogun HPP tensions, water management, strategic decisions, energy independency, commercial ties, prospects for future cooperation, and water-derived risks of conflicts between the two states; it emphasises that the management of water resources counts in the national interest equation of each country, in other words, it is a strong and prominent component of the national interest, which if wrongly coordinated, is afflicting economic stability and human security; it provides an analysis of the Rogun HPP case, an example for further understanding the evolution of international trans-boundary water resources context in the Central Asian region, encompassing the involvement of international financial institutions (World Bank) on conflict mediation and cooperation over water basins.

Argument and Theoretical Framework

My hypothesis is that hydro infrastructure projects initiated by one particular country on trans-boundary rivers adds to the competition over shared water resources that negatively influences the bilateral relations. There have been recorded serious economic, commercial and ecological consequences, *e.g.* transport blockades, restricted transit, border tensions, flooding, droughts, famine, poor sanitation, water-related diseases. However, it may also imply financial restrictions placed by the international community against the upstream country provided it breaks the provisions of international trans-boundary law and principles of neighbouring cooperation. Moreover, hydropower plants on trans-boundary water courses continue to represent a source of concern after their completion once it comes into operational mode or exports the electricity surplus.

Water is a basic human need, an element that preserves life, therefore as an ecosystem constituent it has multi-faceted functionalities in domestic, agricultural, and industrial activities. Concerns over water insecurities emerged several decades ago, but they have augmented lately. In order to signal the difficulties in providing safe water in poor and developing countries, the 1980s were declared the *International Drinking Water Supply and Sanitation Decade* (UN 1985). The present UN action plan is the *International Decade for Action – “Water for Life” – 2005-2015* (as decided by the UN in 2003), emphasising how water insecurities have emerged as a priority on the national and international negotiations agenda. Recent reports issued by the UN Commission on Sustainable Development highlight that almost 20% of the world’s population lacks access to safe water and proper sanitation. These facts are fertile ground for the proliferation of “conditions of water stress” (Conca 2005, 65), defined as water availability of less than 1,700 cubic meters per person per year.

The scientific literature on the geopolitics of water has known an ascendant trend in the last decade. However the geopolitical literature has developed a special focus and large disquisitions on notions like *the territory* and *the national state*, *regional* and *international powers*, and little on water as a commodity that has the potential to generate both conflicts (for water as a source of war see Homer-Dixon 1991, Gleick 1993) and cooperation (for water as a form of enhancing cooperation between communities see Blake 1994). The role of water in many such studies ranges from an economic constituent of the national security, to a resource management problem, but not as a pivotal element in the geopolitical game.

The perspective I am most interested in is the one revealing the geographic complexities of water disputes well explained by Me. Giordano, Ma. Giordano, and Wolf (2002) in "The Geography of Water Conflict and Cooperation: Internal Pressures and International Manifestations". In their research the authors consider the importance of intrastate or domestic water-related conflicts to cause the extension of a water issue across borders. Therefore, they established a conceptual framework to evaluate the spatial relationship between water events, "[...] for determining the extent to which domestic and international conditions influence the state of national and international water conflict and cooperation as well as the direction, or existence, of causal flow" (Me. Giordano, Ma. Giordano, and Wolf 2002, 294). In their approach, the authors revealed that water-related events at the national level are linked to water and non-water events/ tensions at regional/ international scale. The example used by the three authors in their study was India and its two international water basins, the Ganges-Brahmaputra-Meghna and the Indus. We find out that the decision of the Indian government to build the Farakka Barrage in 1951 a few kilometres upstream from the Bangladesh border resulted in years of disputes. Only after 30 years of conflicts, the two countries were able to complete a long-term water-sharing agreement on the Ganges (Me. Giordano, Ma. Giordano, and Wolf 2002, 298). To draw a link to this, Rogun HPP is not just a mere case of hydro energy infrastructure, but first and foremost is a decision of Tajik's government with serious repercussions on its downstream neighbour.

The geopolitics of trans-boundary water resources are related to the political and economic context since trans-nationalisation of water resources implies the cooperation between political or economic actors, between individuals across communities and regions, according to the international law principles. Emerging hydro electricity generation infrastructure, which stands for HPPs construction on trans-boundary rivers, generates conflicts that could escalate from bilateral tensions to military intervention. According to Conca, "the most common form of international water conflict today is not the interstate water war [...], but rather the increasingly trans-nationalised local conflicts between river developers and their opponents" (2005, 75). It is the case of hydropower plants on river basins, such as Rogun, where the beneficiaries are the national-government, transnational builders, financiers of the large-scale water project, while the opponents are the communities affected by water obstruction (Donahue and Johnston 1998). Moreover, water-related challenges are not geographically and socioeconomically evenly distributed (Conca 2005). Central Asian countries do not share the

same amount of water resources therefore water insecurities derive as described in the following pages.

Significant aspects are encompassed to the geopolitics of trans-boundary water afflicting the human security and the environment. A long-term perspective is required on sustainability of water resources regarding the human and in-stream water needs (Conca 2005), to provide sufficient water supply for human domestic needs and sanitation. Other alterations are those of the ecosystems triggered by the human intervention in manipulating water courses, such as intervention in the water cycle, intensive irrigation (which increased the salinity level in major river basins in Central Asia), droughts, flooding in HPPs' water release process. Water pollution as another major cause of water stress, which "problems include dumping inadequately treated sewage and excessive nutrients such as phosphorous and nitrogen, which accelerates algae growth in rivers and lakes, reducing oxygen content and leading to eutrophication" (Conca 2005, 69).

Water and Energy Nexus in Rogun HPP Context

Water and energy nexus is the complex relation established between two strategic components: water resources and energy needs. Water and energy nexus is defined as "a two-way street" (Pumphrey 2012, chap. 3): (1) water requirements for producing energy, "how constraints in water supply or concerns about water quality affect the ability to pursue energy production or conversion" (Pumphrey 2012, chap. 3), (2) how energy relates to the way of providing water for public need. In the water and energy nexus, "water probably comes before energy. For developing countries or countries that aren't fully along the industrial chain, the provision of water is a major time-consuming activity that prevents them from pursuing other kinds of economic activities" (Pumphrey 2012, chap. 3).

Central Asian countries have always been in a continuous competition for water resources. They depend on agriculture that counts for almost one third of their GDP, being major water consumers. The first hydropower plant projects were built in order to develop the region's economies. First proposed in 1959, the construction of Rogun Dam started in 1976, but soon suspended until 1994. Slow progress was reported in the following years and due to disagreements and lack of a common denominator regarding the Tajik initiative, the construction was again suspended in 2008 and 2012. Intricate difficulties in getting the project to an operational mode rise from every side, the financial costs or the neighbouring country of Uzbekistan

that opposes the project. When completed, Rogun is expected to be the highest hydropower plant, measuring 335 meters high, with a capacity of 3,600 MW (Ferghana News Information Agency 2010), announcing good prospects to end the energy dependency protracted crisis that Tajikistan faces especially in relation to Uzbekistan.

In the light of the present case study, most of Amu Darya water flow capacity is formed on the territory of Tajikistan - 72.8% (Amu Darya Basin Network 2010). Tajikistan possesses significant hydropower potential due to the rivers network crossing its territory: Zeravshan, Kafirnigan, Vakhsh, Pyani (the principal tributaries of Amu Darya). Tajikistan is a country which "terrain and climate are highly favourable to the development of hydropower" (World Energy Council 2010, 332). Despite being the beneficiary of such large amount of water resources, Tajikistan is reliant on hydrocarbon supplies from the neighbouring countries and electricity supplies in winter, which are especially delivered from Uzbekistan.

Before 1990, the downstream countries were part of the so-called "cotton-belt" of the Central Asian region. They are rich in hydrocarbon supplies but lack water resources to provide a sustainable agriculture. The other group of countries, called the upstream countries, benefited from a large amount of water for irrigation but instead lacked energy resources. Therefore, a strategy based on mutual dependency was established in Central Asian countries: water for energy resources.

The seasonal variations the region undergoes are described as follows: in summer, the downstream countries require huge amounts of water released by the upstream countries to meet their agricultural irrigation needs; in winter, when the water is scarce, in order to meet the energy needs of the upstream poor in fossil energy resources countries, the downstream states provide them electricity and hydrocarbon supplies. Episodes have been recorded, where the downstream countries cut energy transfers or closed borders to the detriment of the upstream states. Therefore, it is understandable, why the upstream countries strive to built hydropower plants. However, their initiative to gain energy independence is considered an attempt to jeopardise downstream countries' agricultural and ecological security, which claim floods in the water release process and water retention during summers. To put this dynamics into perspective, Kyrgyzstan and Tajikistan possess 90% of the region's water resources, while Uzbekistan alone uses about half of that water, being able to provide

only 14% of its water needs through its own water resources (Central Asia and Caucasus Analyst 2010).

Every country evaluates its specific energy security pattern. Vulnerabilities significantly differ from one another, even from their closest neighbours. "Each country naturally faces a distinctive energy security position, and each country's policy priorities should reflect its uniqueness. One country's position in relation to the availability and affordability of energy services may be favourable, but it may face challenges in relation to reliability and sustainability" (Elkind 2010, 130). It is the case of Tajikistan which due to its geographical and economic particularities expressed the political will to develop several hydro infrastructure projects (Nurek, Zerafshan, Sangtuda, besides Rogun) to secure the parameters of energy security definition: availability, reliability, and affordability of energy.

Water and energy nexus provides a different understanding of water resources as a national strategic asset. After the year 1990 the geopolitical changes that the region underwent produced a paradigm shift in the perception of water resources while the region's food and energy supply also came under threat (Eurasian Development Bank 2008, 7-9) due to the growing population, the expansion of irrigation, and the need of industrial development. This leads to a second implication regarding the hydrological models of the Rogun HPP. Water regulation for hydropower plants on the territory of the upstream countries denotes the main source of tension. The challenge is finding a functional water utilisation model that has to be established between the two countries on a mutual cooperation basis. The model will make possible a rational and effective use of water resources in upstream countries, that under no circumstances could claim the exclusive use of water under international law, so that the population living in the downstream countries could have access to trans-boundary water resources' economic potential as well.

Lack of cooperation models drive to a water and energy nexus causing tension to be accounted for the deterioration of political relations between Tajikistan and Uzbekistan. Even though no large-scale incidents have happened, however, conflicts of lower violence intensity have already been registered: "thus, in 2000, Uzbekistan carried out military exercises at the border with Kyrgyzstan, with the seeming objective of practicing for capturing the Toktogul reservoir, located on Kyrgyz territory but used by Uzbekistan to irrigate fields in Fergana valley" (Central Asia and Caucasus

Analyst 2009). Another episode took place in 1990 when Tajikistan limited the release of water to Uzbekistan due to bilateral disagreements, which resulted in damages to 100,000 hectares of cotton (Central Asia and Caucasus Analyst 2010). In 2009, Uzbekistan cut the electricity supply for Tajikistan which was the peak of Tajik-Uzbek energy disputes.

The deficient communication between Tajikistan and Uzbekistan on shared water courses became an issue of regional echoes, engaging international institutions and diplomats to aim at furthering detente of the situation. It is foreseen that the role of the international community will decrease in the following years once the Rogun HPP project becomes operational. Until then, the hydropower plant is subject of several investment projects of the World Bank, Eurasian Development Bank, and European Union.

Implications

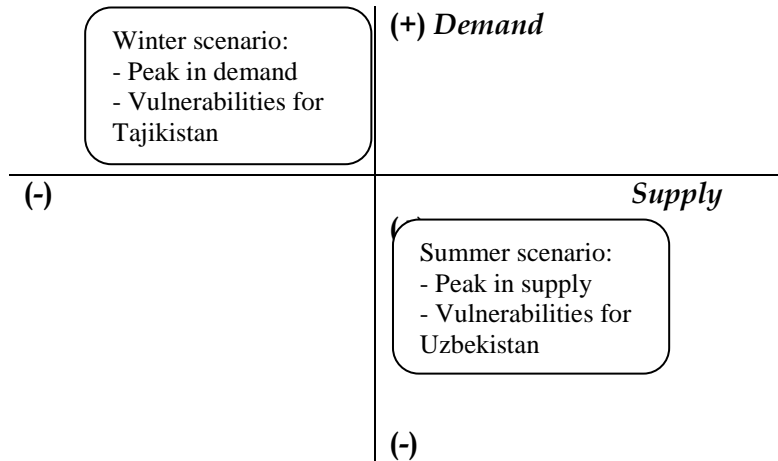
Tajikistan and Uzbekistan are two countries which find themselves in a constant latent state of conflict as a result of the deficient cooperation over trans-boundary water resources. They struggle in acute competition for water resources exemplified by the Rogun HPP. Water is acknowledged as a national asset, apparently favouring the upstream countries, now strongly motivated to develop hydropower plants projects, *e.g.* Rogun in Tajikistan, in order to meet their energy consumption needs.

Economic and Future Cooperation Implications

“The political aspect of energy linked to the sources of supply and demand comes to public attention at moments of crisis” (Pascual and Zambetakis 2010). Very often, in the energy security paradigm, the scientific literature would debate over the risks that are linked to the energy resources reliance. However in the case of Tajikistan and Uzbekistan, the trans-boundary water resources crossing both countries’ territories account rather for potential risks derived from water dependence. The water problem between Tajikistan and Uzbekistan is not a classic supply/demand one. The seasonal differences force the two countries to develop different behaviours of water consumption, described as follows according to two seasonal scenarios: (1) the winter scenario highlights that there is a weak supply of energy but a high demand, therefore *a peak in demand of energy for Tajikistan*; (2) the summer scenario reports a high supply of energy due to the increased rate of electricity generation but a weak demand, therefore *a peak in supply of energy for Tajikistan*. The winter scenario puts a leverage of Uzbekistan on Tajik’s peak in demand, while the summer scenario challenges the Uzbek agriculture system (see Figure 1).

In other words, one country’s opportunity translates into the other country’s vulnerability. Whenever Tajikistan is on the peak of energy demand, it means that the country is in its most vulnerable position regarding water and energy nexus complex. The same, when the peak in supply of energy for Tajikistan takes place, this reveals the most vulnerable position for Uzbekistan in the water and energy nexus. Special climate and geographical conditions are overwhelming and somehow determinant in this cyclic demand and supply peak in energy. The water-derived risks are a consequence of the distribution of water quantity that varies according to the season, or the HPPs generation capacity.

Figure 1. Peak in demand/supply of energy for Tajikistan and seasonal variations (author’s design)



Trans-boundary water resources are placed under the provisions of international regulations stipulated in international agreements or bilateral agreements. One must highlight that according to the international water law, the monopolistic use of trans-boundary water resources by the upstream countries is unacceptable. For this reason, all Central Asian countries were invited to forge ahead with the cooperation in this particular respect. However, “[...] Tajikistan’s leadership views Rogun as a factor of national independence that can bring energy independence, economic development, and legitimacy to the domestic regime in light of poor economic conditions or energy crises” (Central Asia and Caucasus Analyst 2010). To solve this puzzle, an important regional cooperation document was signed in 1992: *Cooperation Agreement on the Joint Regulation,*

Utilisation and Protection of Water Resources from Inter-State Sources, that prevents the potential conflict deriving from the unequal distribution of Amu-Darya and Syr-Darya rivers. The Cooperation Agreement does not stipulate that any country, upstream or downstream as it may be, has the right to control the water resources flowing on their territory with the specific utilisation for hydro projects.

A crucial implication of the Rogun HPP construction is the enhancement of regional cooperation as a condition imposed by the international financial bodies. Cooperation is the key precondition to be awarded financial aid by international organisations such as the World Bank. The international financial institutions specifically praise cooperation since large hydropower plants represent not only energy projects, but especially economic ones (Eurasian Development Bank 2008, 18-29) in terms of the amount of jobs created, regional development, infrastructure or trade. The international bodies strove to mediate the disagreements between Tajikistan and Uzbekistan, provided financial aid and proved to be the supporters of Tajikistan's energy independency. Rogun HPP's price is evaluated at approximately USD 2.9 billion, cost which is impossible to be covered by the Tajikistan's economy alone. As a consequence of regional cooperation, a full regulation body was established in 2006: the Strategy for the Efficient Utilisation of Water and Energy Resources in Central Asia, released by the OCAC (Organisation of Central Asian Cooperation) and EurAsEC (Eurasian Economic Community), that sets rules to create a permanent interstate regulatory and executive institutions to fulfil investment and control water and energy requirements.

Defective regional cooperation implies lack of financial aid from the international organisations. It is important to highlight that the World Bank will cease to finance additional projects if improvements in regional cooperation are poorly envisaged. Note that the World Bank has developed over the last years complementary projects and studies on a large variety of topics: economic, environmental, and water protection. An example of such study: "Tajikistan's Winter Energy Crisis: Electricity Supply and Demand Alternatives", the aim of which is to identify measures to decrease the winter energy deficit towards year 2020 with a total budget of USD 3.4 billion. In terms of recent developments, in October 2013 the World Bank disclosed the conclusions of the Rogun Assessment Studies consisting of two reports (World Bank 2013) discussed on the occasion of The Fourth Riparian Meetings which took place on October 17 - 20th 2013 and focused

on the potential risks to dam safety. An agreement from all riparian countries is of critical importance to assure the continuation of the project.

Along with the World Bank, the European Union was a pivotal partner and one of the most important donors in the region. The political approach was initiated in 1995, when Partnership and Cooperation Agreements (PCA) were signed with Kazakhstan, Uzbekistan, Kyrgyzstan enacted later in 1999. The PCA with Tajikistan was signed in 2004. The EU played the role as “a facilitator helping to create the conditions for investment and business” (Marquina 2008, 59), highlighting the critical importance of the energy sector development. A new document approved by the Council in 2007 (Council of the EU 2007; Schmitz 2008) established the regional political dialogue in the framework of an European Education Initiative and an EU Rule of Law Initiative, with the aim to enhance the rule of law, human rights within the Central Asian republics.

As expected, many difficulties have emerged over the past years in Tajik – Uzbek relation both from political and diplomatic perspectives. One reason is that Tajikistan is developing its hydro potential in order to access external energy markets besides meeting its own economic and domestic needs. The energy mix of Central Asian countries is mainly based on hydrocarbon supplies, especially natural gas and oil, whereas two countries, identified as upstream countries, Tajikistan and Kyrgyzstan, produce hydro energy in an overwhelming percent of 96%, respectively 82%. Tajikistan has the greatest hydro potential of all the other Central Asian states (Eurasian Development Bank 2008, 10), ranking on the 8th position in the world after countries like China, Russia, USA, Brazil or Canada. Despite being so abundant in water supply, the two upstream countries are net importers of energy. Differences between summer and winter electricity production are to be accounted for the energy dependency on Uzbekistan, transforming Tajikistan into a net importer of hydrocarbon supplies in the winter season.

Restricted trade with the neighbouring country is one of the political and economic implications of the unequal use of trans-boundary water resources. Uzbekistan and Kazakhstan rank among the most important trade partners for Tajikistan. The latter imports gas supplies, mineral fertilizers and grain in large quantities, therefore, in what concerns the balance of trade, this had a negative value for the whole year of 2013 (Trading Economics 2013). As a consequence of Uzbek-Tajik tension, the

commercial relation between the two states undergoes significant changes, enabling Tajikistan to seek other potential trade partners. In the context of developing its water hydropower plants, exporting the electricity surplus during summer will bring economic benefits to Tajik government, which is willing to operate Rogun and to export electricity on external markets to future trade partners, like Pakistan, Iran, and India (Central Asia and Caucasus Analyst 2009), becoming a major electricity player of the region. This could make the downstream countries more sensitive and prone to enforce restrictive measures on Tajikistan, but could also mean economic development for Tajikistan as a new electricity hub in Central Asia, transforming Tajikistan into a stronger country from the poorest of the region. Therefore, given the context, in a lack of cooperation scenario, a wise strategy Tajikistan could implement is to generate electricity in summers above its domestic needs, export the surplus to large energy consumers like India or China, and redirect the governmental revenue to buy fossil resources to supply the domestic needs during winter time when the electricity generation is below domestic needs. In this particular case, it is an economic imperative for Tajikistan to develop reliable export markets and reliable customers. These economic relations can only be achieved if they are validated consistently within a time framework.

The commercial change of perspective is mostly due to the trading behaviour Uzbekistan had in the past years towards Tajikistan. Uzbekistan transformed the disruption practice (of railway, freight trains, electricity – Tajik population experienced blackouts during winter months) against Tajikistan into a routine habit. Transit routes have constantly been under transport blockades, determining Tajikistan to have little access to gasoline, aluminium, consumer goods, and food products imported from Russia or other countries. One difficult episode happened in March 2010 when 2000 railcars with cement for the Rogun Dam were stopped at the border with Uzbekistan. The episode brought losses of millions of dollars, but forced Tajikistan to seek a way to escape from the economic isolation pattern. One such example is the Turkmenistan-Afghanistan-Tajikistan railroad project (Central Asia and Caucasus Analyst 2010), part of the Central Asia Regional Cooperation Program, which started in June 2013 expected to be completed in 2015, with a length of 500 km and a cost of USD 400 million financed by the Asian Development Bank. The railroad project's aim is to bypass Uzbekistan, bring economic development into landlocked Central Asian countries and withdraw them from economic isolation.

The ecological implications for the Central Asian countries in the context of Aral Sea shrinkage, the excessive flooding and seasonal droughts may call for political intervention. The environmental complications of the region are so complex, that some may encompass the phenomenon to the “ecology of injustice” (Mitman 2006). This terminology, used especially in the methodological approach by historical environmentalists, explains the relation between pollutants or natural forces and the human beings that raise questions of social and environmental justice. A closer look to Central Asian countries tells us that more than half of century these countries’ agricultural and hydrological potential have been challenged irrespective of environmental consequences on human security. With such a deleterious environmental history, Tajikistan and its neighbour, Uzbekistan, are prone to severe and irreversible damages that have altered over the past decades not only the soil and the water quality, but the very basic economic activities. However, it is interesting to perceive the liaison between water scarcity and ecological challenges in a country like Tajikistan.

Tajikistan’s and Uzbekistan’s populations are in their majority rural, highly dependent on agriculture. Therefore, there is no need to reiterate the importance of water for both states from the economic, energy generation, ecological and human security points of view. Two major hydropower projects are being built in Tajikistan: Rogun HPP and Nurek HPP both on Vakhah River. Therefore, having two large-scale operational hydropower plants functioning at the same time, may cause water shortages in summer for Uzbekistan, which may lead to agricultural loses, ecological problems putting at risk the human health and food security. The World Bank intervened and created the World Commission on Dams in 1997. The Commission monitors that no abuses should take place and the following requirements to be fulfilled by every operational hydropower plant: monitoring the improvement of water supply, preventing flooding and droughts, and develop irrigation agriculture. More important, the Commission emphasised “the need to shift the focus away from dams as ends in themselves and toward comprehensive options assessments for water and energy needs, and to establish efficiency, participatory decision making, sustainability” (Conca 2005, 77). Other focal documents are: the UNECE Convention on the Trans-boundary Effects of Industrial Accidents (Helsinki, 1992), which came into force in 2000, or the UNECE Convention on Access to Information, Public Participation in the Decision-Making and Access to Justice in Environmental Matters (Aarhus, 1998), which came into

force in 2001. The provisions of both Conventions apply to hydro energy projects built on international watercourses.

An ecological question causing distress could be the quality of the hydraulic construction. As explained above, the hydro projects such as Rogun are subject to international financial aid. Therefore, considerable investments are made in the hydraulic maintenance of Rogun installation. Poor water management on shared rivers has the tendency to increase difficulties between the two countries, since the hydrological models can negatively influence agriculture, water quality, and social health in downstream countries. Severe drought and flooding are few of the consequences which can lead to food crisis, water limitation in the much afflicted areas. Moreover, on a long term, the drought scenario is an enormous concern for electricity power production. Often, this may call for reciprocal actions (Eurasian Development Bank 2008, 22) from the downstream countries, which may respond by changing trade preferences and placing restrictions, transit tariffs, visa regulations as explained in the above section of the paper. The existence of about 100 reservoirs in Uzbekistan which contain 1.5 times more water than the volume of the Sea also aggravates the problem, putting further strains on Uzbek-Tajik relations (Central Asia and Caucasus Analyst 2010).

The context of Rogun HPP construction raises human security question for Uzbekistan, “[...] threatening to escalate amidst regional environmental challenges, widespread poverty, border disputes, and lack of inter-state cooperation, especially on water management issues. Such a context generates a potentially explosive environment in Central Asia that has witnessed a number of ethnic and resource-related conflicts in the past.” (Central Asia and Caucasus Analyst 2010).

Risk of Military Intervention

Authors like Yoffe, Wolf, and Giordano (2003) indentify Tajikistan’s water courses under the phrase of *basins at risk*. In their study, basins from Central Asian region were reported to show much higher levels of conflict compared to others. Countries near the Aral Sea are rated in the number one category in negotiating current water conflicts. Their statistics show that “where acute conflict over water has occurred, it concerned quantity and infrastructure, two issues closely related” (Yoffe, Wolf, and Giordano 2003, 1124). Authors’ aim is to reveal how the need for water in agriculture of one state is being associated with the energy generation needs of another state, both emerging in a water-driven regional conflict. The hydro infrastructure a country

decides to operate on a trans-boundary water course might cause changes in the physical system of a basin. An example of such implication, like the one of India and Bangladesh water relations, was described in the theoretical framework section of the present study.

Vulnerabilities in Tajikistan's energy security equation are the lack of fossil resources, the water scarcity in winter, but to all these another significant vulnerability adds: its energy and transport infrastructure. Since the competition for water resources emerged both as a political and as a national security issue, the relations with Uzbekistan took a turn for the worse. Episodes of transport blockades, restricted transit, and border tensions are spread on a more than 20-year time-scale, from 1990 to present time, with military intervention as part of the crisis management strategy.

The so-called "chokepoints" in the energy infrastructure bear vulnerabilities and can be easily strangled. This requires an enforced guarding of these chokepoints, military presence in the process, or an overt intervention if necessary. In relation to this I present here a future scenario envisaged by Nuttall and Manz (2008), through which they describe the transition to clean technologies in energy production secured by military presence in strategic areas of international resource points. Authors develop the idea that "[...] an alliance could also be responsible of defending global fossil fuel tanker chokepoints (Straits of Hormuz between Oman and Iran, through which most Gulf oil is exported, and the Straits of Malacca between Malaysia and Indonesia [...]) [...], monitoring critical energy infrastructure, training local soldiers, co-ordinating energy terrorism intelligence, protecting international companies and their employees, and managing the response to energy crises" (Nuttall and Manz 2008). To my understanding, in the case of Tajikistan, water reservoirs, hydropower plants, electricity grids, energy infrastructure of all kind, appear to be its "chokepoints" in relation to Uzbekistan and other neighbouring countries.

Unfortunately, these chokepoints, which are vulnerabilities in the country's complex energy infrastructure, add to the water and energy nexus, offering favourable conditions for military conflict in the region. Hydro energy infrastructure is not only being challenged by seasonal water variations or neighbouring claims, but they are translated into real vulnerabilities. These vulnerabilities are to be taken care of, monitored, guarded, and military defended if imposed. All these actions call for management therefore

national states developed in years special institutions designed to monitor possible jeopardising contexts, or to intervene in emergencies. "Energy problems have arisen suddenly; they are afflicting many countries worldwide simultaneously; and they strike a diverse and highly sensitive set of interests in many departments of national governments. [...] The political and military implications of the international energy system argue strongly for attention from at least oil-importing nations' departments of energy, departments of defence, foreign ministries, finance ministries and departments for research, environment and industry" (Deese 1980, 144).

The Tajik Paradox

The abundance of resources does not guarantee a path for economic development. The most prominent researchers in the field of resource abundance, Sachs and Warner (2001), found a defective relationship between natural resources and economic growth. The resource curse belief is triggered by the slow economic growth of many resource rich countries.

Central Asian countries have been blessed with fossil energy resources, water basins and river networks. However, there is still much confusion about this abundance of water and a coherent management plan. The quality of institutions (Cabrales and Hauk 2010) accounts as well for this approach, and are decisive in determining whether natural resources are a blessing or a curse. However, this will make the subject of another study.

Tajikistan has the most prominent hydro potential among the other Central Asian countries. Still, is short of energy in winter months when the HPPs do not produce electricity at the same rate as they generate in summer months. All Tajikistan's HPP projects, both already operational or in work, have been placed under serious criticism from its neighbours, have been contested and regarded as threats to the economic stability of Uzbekistan. A small country, Tajikistan, the poorest of the region, blessed with an enormous hydro potential, but unable to make the most of this valuable natural resources. During the Soviet era, Tajikistan's hydro potential was not developed in its advantage. For most of the time the upstream country played the role as a country that had to provide water resources for huge irrigation plans of downstream countries. During the Soviet period, the hydropower potential of the upstream countries was exploited at maximum values, irrespective of the environmental and human security consequences. Tajikistan's situation was one of the worst, caught in a dependent economic relation towards Uzbekistan and other downstream

countries that would sell fossil resources for winter time to Tajikistan. After the collapse of the Soviet Union, the young independent republics entered in a period of competition. Shortly after gaining independence, the international community became interested into the Central Asian countries, primarily not because of the water scarcity-derived risks, but rather because their hydrocarbon resources, gas and oil especially. At present, large-scale hydro projects like Rogun HPP built with international financial assistance are about to transform the beleaguered Tajikistan into an electricity hub on the map of Central Asia, and in the same time, it might open the perspective of future tensions.

Preliminary Findings. Open Perspectives for Further Research

At the beginning of the study I set as an objective to extract economic, social and ecological implications of the trans-boundary hydro projects. As shown, this context is prone to generate tensions to a large extent escalating to possible military intervention. In the case of Tajikistan and Uzbekistan, reliable on water supply, their energy security pattern and governmental approach should consider the environmental implications and water conservation, water management policies and always enhance cooperation practices. The decision-makers proved to be rather inflexible for negotiations and almost in all circumstances discredited the other party position. There is a necessity in the Central Asian countries' governmental practices to develop the hydro potential they have been struggling to do it since they gained their independence. Also, particularities of both countries were discussed in the paper, confirming the existence of a Tajik paradox. International river diplomacy (Conca 2005, 71) may be envisaged as a solution to conflicts that emerge from trans-boundary water utilisation. At least 263 large international rivers are trans-boundary courses. One important document was the 1997 Convention on the Law of the Non-Navigational Uses of Internationally Shared Watercourses understood as a starting point in the above-mentioned water diplomacy that would settle the claims between riparian states and manage the use of shared basins.

The existence of a water and energy nexus highlighted by the Rogun HPP project contributed to a more strategic-oriented scientific debate over the last years as a consequence of the water tensions in the Rogun context. Management of water resources counts as part of the national interest of each country, in other words, it is a strong and prominent component of the national interest, encompassing an interdisciplinary approach, as seen above, gathering geopolitical, ecological and economic perspectives. The

Rogun HPP construction revealed a clearer example on water management, which if wrongly coordinated, affects environmental stability and human security, changes commercial patterns, damages diplomatic ties, trigger reciprocal hostile actions. In the particular case of Tajik – Uzbek relations, water has an economic and human security value: it produces energy, it grows crops, and it maintains the ecologic balance of the region and no country can require monopoly and total sovereignty over the trans-boundary water resources. As shown above, the cooperation between Tajikistan and Uzbekistan should be established according to the international law principles on trans-boundary water utilisation, therefore cooperation models between the riparian countries and a more profound approach are required in the years to come, especially for the reason that tension is foreseen in the post-construction years of Rogun when the hydropower plant will be in full operational mode.

On the path of the research endeavour, the present study leaves uncovered several topics related to water and energy nexus in Central Asia, *e.g.* the leadership typology and the conflict behaviour in water disputes, an insightful understanding of a political approach, which will be debated in further studies.

References

- Amu Darya Basin Network. 2010. *Amu Darya River Basin*.
<http://amudaryabasin.net/content/amu-darya-river-basin>
(November, 2013).
- Blake, Gerald. 1994. "International transboundary collaborative ventures." In *Political Boundaries and Coexistence: Proceedings of the IGU-Symposium in Basle*, ed. Werner A. Galluser. New York: Peter Lang, 359-371.
- Cabrales, Antonio, and Esther Hauk. 2010. "The Quality of political institutions and the curse of natural resources." *The Economic Journal* 121 (March): 58-88.
- Central Asia and Caucasus Analyst. 2009. *Fire over Water in Central Asia*.
<http://old.cacianalyst.org/?q=node/5079> (July, 2012).
- Central Asia and Caucasus Analyst. 2010. *The Rogun Controversy: Decoding Central Asia's Water Puzzles*.
<http://www.cacianalyst.org/publications/analytical-articles/item/12004-analytical-articles-caci-analyst-2010-3-3-art-12004.html> (July, 2012).

- Central Asia and Caucasus Analyst. 2013. *The Turkmenistan-Afghanistan-Tajikistan Railroad Project: The Prospects of the New Silk Road*. <http://www.cacianalyst.org/publications/analytical-articles/item/12866-the-turkmenistan-afghanistan-tajikistan-railroad-project-the-prospects-of-the-new-silk-road.html> (December, 2013).
- Conca, Ken. 2005. "Global Water Prospects". In *From Resource Scarcity to Ecological Security*, eds. Dennis Pirages and Ken Cousins. Cambridge, Massachusetts: The MIT Press, 59-83.
- Council of the European Union. 2007. *The EU and Central Asia: Strategy for a New Partnership*. <http://www.auswaertigesamt.de/diplo/en/Europa/Aussenpolitik/Regionalabkommen/EU-CentralAsia-Strategy.pdf> (March, 2010).
- Deese, David A. 1980. "Energy: Economics, Politics, and Security". *International Security* 4 (3):140-153. <http://www.jstor.org/stable/2626698> (Accessed October 20, 2013).
- Donahue, John, and Barbara Rose Johnston, eds. 1998. *Water, Culture, and Power: Local Struggles in a Global Context*. Washington: Island Press.
- Elkind, Jonathan. 2010. "Energy Security. Call for a Broader Agenda". In *Energy Security. Economics, Politics, Strategies, and Implications*, eds. Carlos Pascual and Jonathan Elkind. Washington, D.C.: Brookings Institution Press, 119-148.
- Eurasian Development Bank. 2008. *Water and Energy Resources in Central Asia: Utilization and Development Issues* (Industry Report). Almaty: Eurasian Development Bank.
- Ferghana News Information Agency. 2010. *Tajikistan-Uzbekistan: Top level discussions over the Rogun project*. <http://enews.ferghananews.com/news.php?id=1561> (December, 2011).
- Giordano, Meredith, Mark Goirdano, and Aaron Wolf. 2002. "The Geography of Water Conflict and Cooperation: Internal Pressures and International Manifestations". *The Geographical Journal* 168 (4): 293-312. <http://www.jstor.org/stable/3451473> (Accessed October 24, 2013).
- Gleick, Peter. 1993. "Water and conflict: fresh water resources and international security". *International Security* 18 (1/Summer): 79-112.
- Homer-Dixon, Thomas F. 1991. "On the threshold: environmental changes as causes of acute conflict". *International Security* 16 (2/Fall): 76-116. <http://www.jstor.org/stable/2539061> (Accessed May 10, 2013).

- Kacowicz, Arie M. 2002. "Case Study Methods in International Security Studies". In *Cases, Numbers, Models: International Relations Research Methods (revised November 2002)*, eds. Detlef F. Sprinz and Yael Wolinsky. Ann Arbor: University of Michigan Press, 119-139.
- Marquina, Antonio. 2008. "The Southeast-Southwest European Energy Corridor". In *Energy Security. Visions from Asia and Europe*, ed. Antonio Marquina. New York: Palgrave MacMillan, 54-69.
- Mitman, Gregg. 2006. „Where Ecology, Nature, and Politics Meet: Reclaiming the Death of Nature". *Isis* 97 (3): 496-504. <http://www.jstor.org/stable/10.1086/508079> (Accessed March 18, 2013).
- Nuttall, William, and Devon L, Manz. 2008. "A new energy paradigm for the twenty-first century". *CeSSA Working Papers*. Brussels: European Regulation Forum on Supply Activities. http://www.cessa.eu.com/sd_papers/wp/wp2/0206_Nuttall_Manz.pdf (Accessed May 10, 2013).
- Pascual, Carlos, and Evie Zambetakis. 2010. "The Geopolitics of Energy. From Security to Survival". In *Energy Security. Economics, Politics, Strategies, and Implications*, eds. Carlos Pascual and Jonathan Elkind. Washington, D.C.: Brookings Institution Press, 9-37.
- Philander, George S., ed. 2008. *Encyclopedia of global warming and climate change*. London: Sage Publications.
- Pumphrey, Carolyn W., ed. 2012. *The Energy and Security Nexus: a Strategic Dilemma*. Pennsylvania: Strategic Studies Institute.
- Sachs, Jeffrey D., and Andrew M.. Warner. 2001. "The curse of natural resources". *European Economic Review* 45(4): 827-838.
- Schmitz, Andrea. 2008. „Efficiency and Its Costs: The <Strategy for a New Partnership> with Central Asia". In *The Potential of the Council Presidency. An analysis of Germany's Chairmanship of the EU, SWP Research Paper*, esd. Daniela Kietz and Volker Perthes, Berlin: German Institute for International and Security Affairs.
- Trading Economics. 2013. *Tajikistan Economic Indicators*. <http://www.tradingeconomics.com/tajikistan/indicators> (January, 2014).
- United Nations. 1985. *International Drinking Water Supply and Sanitation Decade. Proclamation*. A/RES/40/171. New York. <http://www.un.org/documents/ga/res/40/a40r171.htm> (Accessed December 10, 2013).
- United Nations. 2003. *International Decade for Action, "Water for Life", 2005-2015*. A/RES/58/217. New York. <http://www.un-documents.net/a58r217.htm> (Accessed December 10, 2013).

- World Bank. 2013. *World Bank Discloses Next Round of Interim Rogun Assessment Studies*. <http://www.worldbank.org/en/news/press-release/2013/10/01/world-bank-discloses-next-round-of-interim-rogun-assessment-studies> (November, 2013).
- World Energy Council. 2010. *2010 Survey of Energy Resources*. London: World Energy Council.
- Yoffe, Shira, Aaron Wolf, and Mark Giordano. 2003. "Conflict and cooperation over international freshwater resources: indicators of basins at risk". *Journal of the American Water Resources Association* (October): 1109-1126.

