PROBLEMS OF WATER MANAGEMENT IN POST-SOVIET CENTRAL ASIA

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Approval of the Graduate School of Social Sciences

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ABSTRACT

PROBLEMS OF WATER MANAGEMENT IN POST-SOVIET CENTRAL ASIA

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This thesis examines the water-related problems that took place among the Central Asian Republics when the centrally-managed ‘water-energy nexus’ broke down with the dissolution of the Soviet Union. The problems in the region are analyzed in terms of the two transboundary waters of Amu Darya and Syr Darya. While Tajikistan wants to build the Rogun Dam on Amu Darya, Kyrgyzstan tries to establish the Kambarata Dam-1 on Syr Darya. However, these attempts have been criticized by Kazakhstan and Uzbekistan because they need water for irrigation. In other words, different needs of water for these countries create conflicts among them. Therefore, this thesis, by examining water as an unconventional security threat in the region, aims to clarify the questions of whether water has the potential to cause war in the region.

Keywords: Water, Rogun Dam, Kambarata Dam-1, Amu Darya, Syr Darya

ÖZ

SOVYET SONRASI ORTA ASYA'DA SU YÖNETİMİ SORUNLARI

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Bu tez Sovyetler Birliği'nin dağılmasıyla bozulan merkezi düzenlemeye tabii olan 'su-enerji bağı'nın Orta Asya ülkeleri arasında neden olduğu sorunları incelemektedir. Ortaya çıkan bu problemler daha çok Ceyhun ve Seyhun nehirlerinin kullanımında kendisini göstermektedir. Tacikistan Rogun Barajını Ceyhun Nehri üzerine inşa etmek isterken, Kırgızistan da Kambarata-1 Barajını Seyhun Nehri üzerine yapmaya çalışmaktadır. Fakat bu adımlar suyu 'sulama' ağırlıklı kullanan Özbekistan ve Kazakistan'ın tepkisini çekmektedir. Diğer bir ifadeyle, bahsedilen ülkelerin suyu farklı amaçlarla kullanma isteği ortaya çıkan sorunların kaynağını teşkil etmektedir. Sonuç olarak, suyu geleneksel olmayan güvenlik tehdidi olarak algılayan bu tez suyun bölgede savaşlara yol açabilecek bir potansiyeli olup olmadığı sorusuna açıklık getirmektedir.

Anahtar Kelimeler: Su, Rogun Barajı, Kambarata-1 Barajı, Ceyhun Nehri, Seyhun Nehri

To My Parents,

Hacere & Yunus ŞAMLI

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LIST OF ABBREVIATIONS

UN	United Nations
WB	World Bank
GDP	Gross Domestic Product
SPECA	Special Programme for the Economies of Central Asia
ha	Hectares
kWh	Kilowatt hour
ASDB	Aral Sea Drainage Basin
BVO	Basin Water Organization
SANIIRI	Central Asian Scientific and Research Institute of Irrigation
ICWC	Interstate Coordination Water Commission
IFAS	International Fund for saving the Aral Sea
ICAS	Interstate Council on the Aral Sea Basin
ASBP	Aral Sea Basin Program
EC CAEC	Executive Committee of the Interstate Council of the Central Asian Economic Community
CAREC	Regional Environmental Centre for Central Asia
IWRM	Integrated Water Resources Management
WES	Water and Energy Consortium
CIA	Central Intelligence Agency
OSCE	Organization for Security and Co-operation in Europe
CASA-1000	Central Asia-South Asia Electricity Transmission and Trade Project
MW	Millionwatt

HPP	Hydropower Plant
FAO	Food and Agriculture Organization of the United Nations
EUCAM	Europe-Central Asia Monitoring
USAID	United States Agency for International Development
WWAP	United Nations World Water Assessment Programme
OECD	Organisation for Economic Co-operation and Development
UNWC	UN Convention on the Law of the Non-Navigational Uses of International Watercourses
SCO	Shanghai Cooperation Organization
ADB	Asian Development Bank
UNECE	United Nations Economic Commission for Europe
UNESCAP	United Nations Economic and Social Commission for Asia and the Pacific

CHAPTER 1

INTRODUCTION

1.1. Scope of the Thesis and Argument

This thesis will analyze the water problems in Central Asia after the dissolution of the Soviet Union in 1991. Contrary to the common idea, the thesis will point out that the problem of water in the region is a management problem rather than scarcity.[1] The main conflicts in the region over water are on the two transboundary rivers of Amu Darya and Syr Darya, which refer to sources of freshwater that are shared among multiple user groups, with diverse values and different needs associated with water use. While in the case of Amu Darya, Tajikistan and Uzbekistan are face-to-face because of the Rogun Dam; in the case of Syr Darya, Kazakhstan and Uzbekistan oppose to the idea of building the Kambarata Dam-1 in Kyrgyzstan. This thesis, by examining water as an unconventional security threat in the region, aims to shed light on the questions of whether water has the potential to cause war in the region. More specifically, the study asks two main questions: 1) How does the Rogun Dam on the Amu Darya River affect the relations between Uzbekistan and Tajikistan? 2) How does the Kambarata Dam-1 on the Syr Darya River affect the relations between upstream Kyrgyzstan on the one side and downstream Uzbekistan and Kazakhstan on the other? As will be elaborated below, in this thesis I will use what I call water-induced-

[1] People living in the region are fairly well provided with water - on average, about 4000 tons of surface (river) water per person annually (Valentini, Orolbaev, and Abylgazieva, 2004). In general, an amount of less than 3000 m^3/capita may be regarded as economic water scarcity and less than 1000 m^3/capita as physical water scarcity (Bekturganov et al., 2016, p.3). According to this criterion, only Uzbekistan with 1870 m^3/capita falls below the threshold for economic water scarcity, but not for physical water scarcity.

cooperation understanding rather than water-induced war,[2] to analyze the issue at hand and to answer the research questions. For that purpose, this thesis will look at water management in Central Asia as an issue of national interest that became much more observable after 1991. With the emergence of five independent states centrally managed water and energy agreements among ex-Soviet republics were irrelevant. In this context, this thesis will argue that water management became a problematic security issue that has a potential to cause serious tensions and even war.

According to experts, water is ranked second only to oxygen as being essential for life.[3] More than half of the human body weight consists of water. Besides, while it is possible to survive without food for weeks, no person can survive for more than a few days without drinking water. To clarify how significant water is to a person, it is necessary to consider its benefits. Water is used in every cell of the body and it travels throughout the whole body carrying nutrients, oxygen, and wastes to and from the cells and organs (Cotruvo, 2015). Also, water keeps human body cool as part of the body's temperature regulating system. In addition, water cushions joints of people, and protects the tissues and organs from shocks and damages. Water also helps the body in digestion and absorption of food, as well as in the removal of wastes. A regular person loses 2-3 quarts (8-12 cups) of water through sweat, urination, and evaporation every day. This proportion can change during exercise, place of residence (in hot or low humidity environments people lose more water) and what s/he consumes (high fiber diets or beverages containing caffeine have different impact). Therefore, it is important to drink at least 8-10 cups of water in a day for a healthy body and to avoid heat stroke or exhaustion (Cotruvo, 2015).

Freshwater is essential for human life. In the 20th century as the world's population tripled, water consumption rose by 700 % (Jenkins-Young, 2013, p. 2). By 2050, with

[2] Water-induced war or water war is a term that clarifies the relationship between problem over water and war. The idea is defended by some scholars such as Peter Gleick, Joyce Starr, John Cooley, John Bullock and Adil Darwish.

[3] http://www.ctahr.hawaii.edu/new/Newsletter/ImportanceWater.pdf (accessed on April 20, 2016).

3 billion more people, we will consume 80 % more water. But even today we are facing a freshwater crisis. Even though the majority of our planet is covered with water, most of it is too salty or deep to be reached. Therefore, as little as 0.75 % of the total water available on earth is accessible fresh water (Jenkins-Young, 2013, pp. 3-7). In other words, over 97 % of the water resources are not suitable for drinking due to excessive mineralization.[4] Moreover, the actual stocks of fresh water are not so substantial, since almost 90 % of them can only be found in polar ice and glaciers (Ibatullin, 2015).[5] Therefore, fresh water is found only in the clouds in the atmosphere and hidden in highly elevated glaciers or hardly accessible depths of the earth and only 1 % of the total water resources are available for humans (Valentini, Orolbaev, and Abylgazieva, 2004, p. 8).

Furthermore, global warming, pollution and population explosion have left 2 billion people in water stressed regions and 783 million people, i.e, 11 % of the world's population, do not have access to clean and safe drinking water (Allahverdiyev, 2015, p. 34). By the year 2025, 1.8 billion people will face water scarcity (Maestu, 2015, p. 32).

Scarce water resources pose significant threats to human security and regional stability because competition for limited supplies can lead nations to see access to water as a matter of national security (Gleick, 1993, p. 79). However, the real threat is poor management of water. In 2006, the United Nations reported that many of the world's water problems come not from the physical absence of freshwater, but from poor governance. Effective water management is not easy since freshwater is often not controlled or undisputedly owned by one nation. In other words, the problem of water management means the problem of management of transboundary waters. There are 276 transboundary river basins in the world, 200 transboundary aquifers have been

[4] Because they are in seas, oceans, and depths of the earth.

[5] Mainly in the Antarctic and in Greenland.

identified and 148 countries have one or more transboundary river basins.[6] 39 countries have more than 90 % of their territory within one or more transboundary river basins. That's to say, approximately 40 % of the world's population relies on transboundary waters (Jenkins-Young, 2013). Therefore, water management problem in the world raises security questions for the countries that are parties of such disputes.

In this thesis, water is regarded as an unconventional security threat which can be effectively dealt with water-induced cooperation understanding.

1.2. Literature Review and Theoretical Framework

The concept of security has many different meanings in international relations. For example, as argued by realists, security has to focus on military issues because the military security is at the top of the hierarchy of important security issues.[7] Eric Herrick (2007, pp. 130-134) defines military security as follows:

> Military security usually refers to perceived or actual freedom from the threat or use of organized violence for political purposes.... Military security focuses on organized violence as opposed to the violence of individuals…Hence criminal violence—violence for private purposes such as personal hostility or material gain through robbery—is left out…. Avoidable deaths and suffering caused by poverty, hunger, disease or economic sanctions are also excluded…. Thinking about military matters was primarily about strategies used especially by states of how to fight and win war.

However, when the Soviet Union collapsed in 1991, scholars of international security realized that they had to redefine the security and security-related concepts with a specific attention on low politics. Actually, even before the end of the Cold War, some scholars such as Richard Ullman (1983, p. 129) focused on the importance of low politics:

> Defining national security merely (or even primarily) in military terms conveys a profoundly false image of reality. That false image is doubly misleading and therefore doubly dangerous. First, it causes states to concentrate on military

[6] http://www.unwater.org/fileadmin/user_upload/unwater_new/docs/transboundary_waters.pdf (accessed on May 2, 2016).

[7] The hierarchy states that military security is high politics, economic and social affairs are low politics.

> threats and to ignore other and perhaps even more harmful dangers. Thus it reduces their total security. And second, it contributes to a pervasive militarization of international relations that in the long run can only increase global insecurity.

The reason why military security lost its top-level priority after 1991 is due to the fact other factors can also pose threats to the survival and development of a sovereign state and humankind as a whole. These other factors as stated by Buzan and his colleagues are the unconventional security threats such as environmental, economic, social and political threats, which have gained more importance in the post-Soviet era (Buzan, Waever, and de Wilde, 1998, pp. 22-23).

Conventional security theory used to serve as a basis for any national security doctrine, including military security (Eshchanov, Plaat Stultjes, Salaev, and Eshchanov, 2011, p. 1574). In this context, scholars claim that security is when "a nation is secure to the extent to which it is not in danger of having to sacrifice core values, if it wishes to avoid war, and is able to, if challenged, to maintain them by victory in such war" (Swanström, 2010, p. 38). This old view of security has largely changed with the globalized world and non-military issues has taken a prominent position in the discussions on security. Therefore, today threats may not only be military as traditionally described, but may include a variety of other non-military forms such as organized crime, terrorism, drug trafficking, maritime piracy networks, and intra-state conflicts (Srikanth, 2014, pp. 60-68).

As mentioned above, unconventional security threats including environmental, economic, social and political challenges, gained more importance after the end of the Cold War period. Even before 1991, Ullman (1983) described unconventional security threats as "anything degrading the quality of life of a nation or limiting the nation's policy options". For Marc Levy (1995, pp. 37-38) an unconventional security threat emerges when some of the nation's values are drastically degraded by external action.

However, one of the unconventional security threats that has not received enough attention it deserves is water, as claimed by Niklas Swanström (2010, p. 37): "Water has not received the attention they deserve and has drowned in the media attention

regarding the terrorist threat and the soft and hard implications this threat could have on society."

Beatrice Mosello also regards water as unconventional security threat and mentions that water became a sensitive issue with the end of the Cold War as its meaning changed suddenly (Mosello, 2008, p. 153):

> Water has increasingly been perceived as a global common, thus starting a debate over the need for collective action in order to avoid a so-called 'tragedy of the commons.[8]' In the early 1990s, largely as a result of the end of the Cold War and the consequent decay of 'traditional security threats,'…… Water management became associated with security concerns, a phenomenon that has been labeled as the 'securitization[9] of water resource management'.

The transition from 'tragedy of commons' to 'securitization of water management' meant that water became a national security concern; it is now taken "out of the normal domain of technical management" and placed "in the secret and closed domain of security officials" (Buzan, Waever, and de Wilde, 1998, p. 23).

Peter Gleick (2015) states that there is a long history of conflicts over water resources, extending back thousands of years into myths, legends and ancient history.[10] According to him, during the 21st century, "water and water-supply are increasingly likely to be both objectives of military actions and instruments" (Gleick, 1993, p. 79). Other scholars such as Joyce R. Starr, John K. Cooley, John Bulloch and Adil Darwish also think that we will see water-induced wars in the near future. For example, according to Joyce Starr (1991, p. 17):

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[8] Mainly as an economic issue, the tragedy of commons defines the conflict between individual interests and the common good over finite resources. In 1968 ecologist Garrett Hardin wrote the article 'The Tragedy of the Commons' to explain unrestricted demand for a finite resource affecting all people who need to use it (Hardin, 1968).

[9] Securitization is defined as an extreme form of politicization which makes an issue the most important one with absolute priority because of its potential of being an existential threat (Buzan, Waever, and de Wilde, 1998, pp. 23-24).

[10] This study has been continuously updated. This is the version that was updated in December 2015. Moreover, at the website the version in 2008 is available but it is in Spanish.

> As early as the mid-1980s, U.S. government intelligence services estimated that there were at least 10 places in the world where war could break out over dwindling shared water—the majority in the Middle East. Jordan, Israel, Cyprus, Malta, and the countries of the Arabian Peninsula are sliding into the perilous zone where all available fresh surface and groundwater supplies will be fully utilized.

John Cooley (1984, p. 3) also warns about the war-inducing potential of water: "Water is likely to cause war…. break empires and alliances in the region….The constant struggle for the water, which was the principle cause of the 1967 Arab-Israeli war, could help a spark a new all-out conflict." Besides, John Bulloch and Adil Darwish (1993) state that not oil, but conflicts over water are likely to threaten regional stability. Furthermore, Casey Simons and Flora Pidoux (2015, p. 9) express the possibility of water wars in near future: "It is expected that over the next 10 years, competition over the water will increase and shared resources will be a contributing source of political tension."

However, there are other scholars who claim that water can open a way for the countries to cooperate with each other and that there were not any water wars in history. Rather, there have been several treaties and agreements over water among several countries throughout history.[11] Therefore, it is possible to suggest, as will be done in this thesis, that problems over water can be solved by mutual cooperation among the parties. According to Jenkins-Young (2013, pp. 61-67), historical, economic and strategic reasons as well as shared interests over water are the main reasons why water will more likely to result in cooperation.

Similarly, Wolf (2006) comments that avoiding conflict over water is vital because: "Conflict is expensive, disruptive, and interferes with efforts to relieve human suffering, reduce environmental degradation". In other words, "Violence over water does not seem strategically rational, hydrographically effective, or economically viable. Shared interests along a waterway seem to consistently outweigh water's

[11] Although these scholars claim that there are many agreements and treaties in history, the numbers are controversial. For example, while according to one study approximately 300 treaties have been negotiated on water and water-related issues between countries since 1814 (Wolf, 1998, p. 255). The UN Food and Agriculture Organization claims there have been more than 3,600 treaties on international water resources between 800s and 1984.

conflict-inducing characteristics" (Wolf, 2006). In this context, by relying on the data from the World Bank, Maestu (2015, pp. 38-39) claims that water cooperation is helpful for stakeholders to come together around a common understanding although there are some risks that need to be reduced:

> Water cooperation is a goal… According to the World Bank, there are some important lessons on what works in water cooperation. We have seen that making cooperation work is a long process requiring a set of enabling conditions that need to be established before mutually beneficial and enforceable agreements can be reached. A clear understanding of how this happens is the key to foster similar processes in the future. While the associated economic benefits and costs of cooperation are generally well analyzed, the perceptions of decision-makers regarding political risks and opportunities have been much less explored. According to the World Bank the critical change that needs to be promoted is the shift in people's perception so that, first, opportunities must be perceived as more important than the risks involved in cooperation and, second, the perceptions of the benefits are more significant than the opportunity costs of not coming to an agreement.

For that reason some areas are defined to help in reducing risk and facilitating a shift from confrontation or deadlock to productive agreements: Knowledge and skill expansion, institutional development, program design, financing, facilitation, and decision legitimacy (Maestu, 2015, p. 39).

The different international initiative over transboundary waters helped states to openly discuss their issues, creating mechanisms for cooperation in water management among all stakeholders, improving comprehension of challenges and benefits of water cooperation, building mutual respect, understanding and trust among countries, as well as promoting peace, security and sustainable economic growth. Furthermore, there are some factors for success on water cooperation such as active and continuous involvement of a third party mediator, involvement of social aspects, creative methods of financing, creation of incentives through shared benefit models, water assessments/data analysis, scenario planning, step by step approach, private sector involvement/partnerships, and having a functioning secretariat (Maestu, 2015, pp. 42-43).

1.3. Water in Central Asia

One of the regions where transboundary waters have created problems is Central Asia. This landlocked, mountainous and arid region covering about 4 million km^2 area with almost 66 million people is bordered by Russia in the north, China in the east, Afghanistan and Iran in the south, and Caspian Sea in the west. The region that was defined by Halford Mackinder[12] as Heart of the World has always been one of the most important locations. Many empires wanted to take advantage of the region such as Bactaria (250 BC-125 BC), the Kushan Empire (30-375), Göktürks (552-744), Uigurs (745-840), Karakhanids (840-1040), and Seljuks (11th-13th centuries). The region was also ruled by the Khiva Khanate (1511-1920), the Bukhara Emirate (1785-1920), and the Kokand Khanate (1709-1876) until the Tsarist Russian invasion in the 19th century (Abazov, 2007, pp. 23-34).[13] With the Bolshevik Revolution in 1917, the Soviet rule was established in Central Asia. Whereas the Soviet Union was the only power to govern and control the region until 1991, many other powers which wanted to cooperate with the Central Asian republics emerged in the post-Soviet era, such as the US, Japan, Turkey, and China.[14] As mentioned by Sievers (2002, p. 356), in the

[12] The British geopolitical scholar who set the idea of 'Heartland Theory' in 1904 in one of his article to the Royal Geographical Society titled 'The Geographical Pivot of History' as well as in his book 'Democratic Ideals and Reality' in 1919. In the mentioned years, Mackinder defined the northern central core of Eurasia as "Heartland" of the world on which powers should contest for global hegemony:
Who rules East Europe commands the Heartland;
Who rules the Heartland commands the World-Island;
Who rules the World-Island commands the world.

[13] The dates given in parentheses are the dates to remark the foundation and disestablishment years, not to specify the years to take control of the region. For example, the Bukhara Emirate was under the protection of Tsarist Russia during 1873-1917 as an independent state even though it came to an end in 1920 like the semi-independent Khiva Khanate (Ziyayev, 2007, pp. 7-31).

[14] All of these countries had their own priorities and expectations from the newly independent countries of Central Asia. For more information, see: Gregory Gleason and Zhang Jiadong, "Central Asian States and Policy Triangles: China, Russia, and the United States", in *The United States, Russia, and China: Confronting Global Terrorism and Security Challenges in the 21st Century*, ed. Paul Bolt, Su Changhe and Sharyl Cross (USA: Praeger Security International, 2008), 139-157; Joshua Kucera, "China's relations in the Asia-Pacific: Central Asia", http://thediplomat.com/2011/02/central-asia/ (accessed on May 29, 2016); Mirzokhid

aftermath of the dissolution of the Soviet Union the region became important for the global and regional powers not only on economic or energy issues, but also for security purposes because of four main reasons:

> The region's importance for regional and global security was well-recognized for a variety of reasons, the four most obvious of which follow. First, an Islamic region, it borders Afghanistan, Iran, China, and Russia and is a party to the complex regional politics of all these states. Second, it sits at the center of a narcotics trafficking corridor that could also be used to smuggle weapons of mass destruction. Third, as successors to the Soviet military industrial complex, all the states have know-how in chemical, nuclear, and biological weapons production, and all the states had some or all of such weapons at the time of independence in 1991. Fourth, because it is rich in hydrocarbons, the region could provide an alternative to Middle East oil in coming decades.

How the states of Central Asia react to such threats to security within and across their borders, and even their very capacity to contain these threats, depend on a variety of factors. The internal threats to the stability of these republics have been growing in recent years such as separatist movements, ethnic conflict, foreign aid, non-democratic oligarchies, and religious fundamentalism (Sievers, 2002, p. 356). However, another issue that threatens the internal security of Central Asia is water problem, the main topic of the thesis. The problem over water in Central Asia, as mentioned earlier, is water management problem of Amu Darya and Syr Darya.

The Amu Darya River flows west through Uzbekistan, Turkmenistan, Kyrgyzstan, Tajikistan, and Afghanistan (Kulmatov, 2007, p. 15). While it is shared by four of the five Central Asian republics, the greatest conflict over the river exists between Uzbekistan and Tajikistan on building the Rogun Dam. The Syr Darya River originates in the mountains of Kyrgyzstan and flows northwest through the Ferghana Valley of Uzbekistan, Tajikistan and Kazakhstan where it eventually drains into what remains of the Aral Sea (Kulmatov, 2007, p. 16). Until 1990, the main function of Syr Darya

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Rakhimov, "Central Asia and Japan: Bilateral and Multilateral Relations", *Journal of Eurasian Studies* 5 (2014): 77-87; Rajan Menon, "Introduction: Central Asia in Twenty-First Century", in *Central Asia: Views from Washington, Moscow and Beijing,* ed. Eugene Rumer, Dimitri Trenin, and Huasheng Zhao, (New York: M.E. Sharpe, 2007), 3-17; Igor Torbakov, "Turkey and Post-Soviet Eurasia: Seeking A Regional Power Status", in *Prospects for Democracy in Central Asia,* ed. Birgit Schlyter, (Sweden: Alfa Print, 2005), 117-128.

was to provide water for the irrigation economies of Uzbekistan and Kazakhstan. However, with independence, the Kyrgyz government decided to take a step to halt the power shortage in Kyrgyzstan and the Kambarata Dam-1 was proposed to be constructed in 2010 just above the Kambarata Dam-2 (with cooperation between Uzbekistan and Krygyzstan) (Matveeva, 2012).

To better understand the water issue in Central Asia we should know more about the historical background of water in the region. Agriculture has always played a pivotal role in the social and economic lives of the people in Central Asia and even today continues to account for much of the employment and gross domestic product (GDP)[15] in these countries (Asian Development Bank, 2010, pp. 120-138). Since the biggest requirement of agriculture in Central Asia is water (Frenken, 2013, pp. 41-45), water management emerges as an important in the region.[16]

Historically, there have been 5 paradigms of water management that can also be applied in Central Asia (Allan, 2003, p. 10). The first paradigm was until 1860s (i.e, the invasion of Tsarist Russia). In this period the management of water was organized by *mirabs* (water controller) and *ariq-aksakals* (managers of irrigation canals) elected from locals who used the main canals (Matley, 1994, p. 280). The second paradigm covered the policies of Tsarist Russia until the Soviet era. At that time the Department of Farming and State Properties of the Turkestan region supervised the water-related issues (Valentini, Orolbaev, and Abylgazieva, 2004, p. 23).[17] The other three

[15] The added value of agriculture to the GDP is about 10 % for the Central Asian region and on average, about 30 % of the economically active population are engaged in farming (Bekturganov et al., 2016, p.5).

[16] Over two thirds of the world's water consumption volume is used for agricultural purposes, mostly for the needs of irrigation. This indicator has historically been high – about 90 % – in Central Asia (Valentini, Orolbaev, and Abylgazieva, 2004). In addition, 22 % of total water is used by the energy sector and 8 % is used for meeting the demand in houses and workplaces (Allahverdiyev, 2015, pp. 25-31).

[17] The department was created in 1897 just after the first regulation that enacted the water management procedure under direct supervision of officials: "Temporary Rules on Irrigation of the Turkestan Region". The operation of the department initially pursued one strategic objective that was to turn Turkestan into a large exporter of not only cotton, but other agricultural products. For that purpose the "Turkestan Agricultural Society" was created in

paradigms (the 3rd, the 4th, and the 5th ones) were related to the policies of the Soviet Union. During the Soviet period, water was managed by centrally-organized Ministry of Water Management.

During the Soviet era, leaders in Moscow decided to introduce cotton farming in the downstream riparian republics of Central Asia (Jenkins-Young, 2013).[18] Since all water resources were centrally-managed from Moscow by the Ministry of Water Management in this period, Moscow used dams and canals to control Amu Darya and Syr Darya, which are located in Tajikistan and Kyrgyzstan, for providing abundant resources for the downstream countries for cotton-producing (Bıyıkoğlu, 2010). Also, due to the fact that the priority of the Soviet government was cotton, it did not allow Kyrgyzstan and Tajikistan to use the stored water in dams to generate electricity. Instead, the downstream countries (Kazakhstan, Uzbekistan, and Turkmenistan) would provide Tajikistan and Kyrgyzstan gas and coal in the winter (International Crisis Group, 2014).

Because of the imposed prioritization of cotton-producing for the downstream countries, Moscow's projects not only created an upstream/downstream division between the states but also caused the cotton-producing states to become totally dependent on water for all economic activities. Furthermore, the upstream countries became highly dependent on the downstream countries for electricity (Izquierdo, Stangerhaugen, Castillo, Nixon, and Jimenez, 2010).

When the Soviet Union collapsed in 1991, the previously centralized water and energy sharing agreements among the Soviet republics broke down. Kyrgyzstan and Tajikistan wanted to use their water for producing power for their own countries, whereas the downstream countries needed water for irrigation. Since then, these republics have been in competition for the region's water resources. Nevertheless,

1895, to initiate studies of the agricultural potential of the region (Valentini, Orolbaev, and Abylgazieva, 2004, p. 23).

[18] The word comes from ripa, meaning 'bank' or 'shore'. First appearing in English in the 19th century, "riparian" refers to things that exist alongside a river (such as riparian wetlands, habitats, trees, etc.).

interstate violence has remained at fairly low levels among the five republics and they have successfully avoided an outright interstate water war since 1991. However as argued by some experts water and water-supply systems are increasingly likely to be both objectives of military action and instruments of war (Gleick, 1993, pp. 86-89). In other words, the two mainstream transboundary waters, i.e, Amu Darya and Syr Darya have the potential to ignite an international war similar to fuel wars; as such we may see water wars in the region (Committee on Foreign Relations, 2011, p. 11).

According to Swanström (2010, p. 37), water has the potential of bringing Central Asian states to the brink of war. Water is accepted as an unconventional security threat because of its potential to cause tension in the region: "The water issue threatens to bring states to war and in extreme cases, deprive some regions in Greater Central Asia from any chance of human sustainability. The tension is particularly high between upstream countries (Tajikistan and Kyrgyzstan) and downstream states (Uzbekistan and Kazakhstan and to certain extent Turkmenistan)."

Frederick Starr (1999, p. 4) also makes similar comments: "Anyone studying security issues in Central Asia quickly recognizes that environmental factors — the use and control of land, water, energy, and other raw materials, and the reclamation of polluted lands — play an extremely important role in that region's security and political agendas."

Likewise, according to Yury Daneykin, Elisey Andreevsky, Mikhail Rogozhin, and Oleg Sernetsky (2015, p. 87) transboundary water problem is a regional threat:

> Transboundary water and energy problems, which exist between the countries of upper and lower stream lines of major rivers Amu Darya and Syr Darya. These problems include: building of large hydroelectric power plants in Kyrgyzstan and Tajikistan that is strongly opposed by Uzbekistan at first; use of existing hydroelectric power plants in Kyrgyzstan and Tajikistan not for irrigation, but for energy production the water is discharged in the winter period, while in the summer period there is not enough water for irrigation in neighboring Kazakhstan and Uzbekistan (in the Soviet period hydroelectric plants were usually used for water accumulation for irrigation in the summer period, and in the winter period Uzbekistan and Kazakhstan supplied Kyrgyzstan and Tajikistan with gas, coal and fuel oil for the work of thermal power plants).

As mentioned above, change in the meaning of water (from tragedy of commons to securitization of water) made it a national security concern for Central Asian countries. According to Mosello (2008, p. 153), securitization of water-related issues discourages cooperation and increases water-related disagreements in the region:

> In particular, Central Asian states have tended to securitize water-related issues, often motivated by national concerns over economic development, the need to control ethnic tensions and social uprisings, and the need to manage environmental degradation and population growth. Securitization, in turn, has dissipated the prospect of a hydro-political complex in the region, thus wasting the 'cooperation-inducing' potential of water resources.

Thus, when we look at the situation in Central Asia, in some cases some coordination is being seen, especially in response to the Aral Sea challenges.[19] Kazakhstan, Uzbekistan, Turkmenistan, Tajikistan, and Kyrgyzstan formed the Interstate Commission for Water Coordination of Central Asia and pledged 1 % of their budgets to help recover the sea (Maestu, 2015, p. 82).[20] However, when the topic comes to Amu Darya and Syr Darya, the cooperative atmosphere among the Central Asian republics disappear. Even though there are many agreements, declarations, initiatives between the republics on the two transboundary rives such as the Almaty Agreement (1992), the Nukus Declaration (1995), the Almaty Declaration (1997), the Ashgabat Declaration (1999), and the Dushanbe Declaration (2002), the problem in the region still continues (Chatterjee, 2007, p. 296).

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[19] The Aral Sea level has decreased by more than 20 meters since 1950 because of the irrigation development projects aiming at improving economic conditions in the region and addressing food and cotton security, and it has caused the sea to separate into two water bodies, the Southern and Northern Aral Seas. Also Aral was the 4th largest body of inland water in the world but now it is the 6th (Izquierdo, Stangerhaugen, Castillo, Nixon, and Jimenez, 2010). Finally, all these things created "the youngest desert in the world": Aralkum (Dempsey, 2014).

[20] Moreover, on April 28, 2009 under the chairmanship of President Nazarbaev, the Heads of the States gathered to promote regional cooperation to overcome the consequences of the tragedy of the Aral Sea and to more effectively manage shared water resources. The five presidents expressed readiness to further improve collaboration on trans-boundary waters, taking into account the mutual interests of all Central Asian countries. Under this statement, several Agreements and Memorandums were signed between the Executive Committee and UN donor organizations (Ibatullin, 2015).

Some scholars state that Central Asian countries joined international conventions just for the sake of joining them and that they avoid agreements that would result in state policy reforms over water (Valentini, Orolbaev, and Abylgazieva, 2004). Although regional and international institutions, together with the establishment of independent monitoring and assessment units can help to promote cooperation in shared river basins (Daoudy, 2007), there has not been much success so far. It has been stated that there are five main reasons for the failure of institutions and agreements in dealing with water resources in the Central Asian region: limited mandates, constrained autonomy, weak institutional capacity, insufficient financing, and lack of enforcement (Mosello, 2008, pp. 160-163).

In other words, since independence Central Asian countries could not agree on developing common management policies that could reasonably balance their irrigation and/or energy needs and avoid an eventual water-induced conflict in the long-run. As Libert, Orolbaev, and Steklov suggest (2008, p. 12):

> The water situation in Central Asia is unique, determined in particular by the fact that the main river basins were previously used and developed as national within a single state (USSR) but are presently transboundary and shared by independent nations. In this situation, it is not easy to provide a straightforward answer as regards the determination and interpretation of the rights and obligations of upstream and downstream countries.

1.4. Outline and Methodology

As mentioned earlier, this thesis will develop its arguments on what I call water-induced-cooperation in Central Asia because although water is an unconventional security threat in the region with some potential to cause war and there has not been any effective cooperation among the countries, so far no such conflict emerged.[21]

[21] However, some clashes have been experiencing but these happened at local level such as in Ferghana Valley. Although the clashes were at local level, many scholars claim that Ferghana is the most volatile region in Central Asia. Therefore, if conflicts happen in Ferghana Valley among the ethnicities (because of its delimitation by Soviet Union, the region belongs to Kyrgyzstan, Tajikistan, and Uzbekistan) they might affect over all region. For more information on Ferghana Valley: https://www.chathamhouse.org/sites/files/chathamhouse/public/Research/Russia%20and%20Eurasia/270111summary.pdf (accessed on October 10, 2016); https://www.academia.edu/7719045/Ferghana_Valley_The_Heart_of_Central_Asia_F._Starr

Therefore by looking at how the downstream countries of Uzbekistan and Kazakhstan choose to enter into negotiations with the upstream countries of Tajikistan and Kyrgyzstan on the Rogun Dam and Kambarata Dam-1 need to be clarified.

This thesis will be made up of five main chapters. After the Introduction, in the second chapter, the history of water management in the region will be described. In this chapter, firstly the situation in the region prior to independence will be mentioned. Then, in order to answer the question of what has been done so far, the chapter will focus on the actions of Central Asian states over the issue of water management since 1991. In the third chapter, the focus will be on the Rogun Dam that creates tension between Uzbekistan and Tajikistan. The fourth chapter will clarify how the Kambarata Dam-1 has an impact on the relations between upstream Kyrgyzstan and downstream Kazakhstan and Uzbekistan. The last chapter will be the Conclusion where the main findings on the topic will be discussed and some recommendations to solve the ongoing problem of water will be made.

The thesis which is a documentary research has a qualitative analysis. The sources for the data collection will be newspapers, electronic and printed journals, relevant books, and other published and unpublished works. Also, relevant reports of organizations such as the World Bank, United Nations Special Programme for the Economies of Central Asia, the Stockholm International Water Institute, World Health Organization, and Asian Development Bank are used. These resources are essential in understanding water management in the region.

_ed. . 2011 (accessed on August 25, 2016); http://www.mercycorps.org/files/file1134154677.pdf (accessed on August 25, 2016).

CHAPTER 2

HISTORY OF WATER MANAGEMENT IN CENTRAL ASIA

In this chapter, history of water management in Central Asia is given under two main headings: Water management until the disintegration of the Soviet Union and water management after 1991. As is elaborated, post-Soviet policies regarding water and conflicts over water have historical roots going back to ancient times.

2.1. Water Management until the Disintegration of the Soviet Union

Agriculture has always played a pivotal role in the social and economic lives of the Central Asian people. According to some reports, agriculture creates jobs for many people and it establishes a significant part of the Gross Domestic Product (GDP) for the whole region (Asian Development Bank, 2010, pp. 120-138). Since agriculture is based on irrigation, water is the first and the foremost resource for agriculture in the region, making water management the most significant asset (Frenken, 2013, pp. 41-45). In this chapter, both the historical importance of water and water-related issues and the history of water management in the region is analyzed.

Since the ancient times, Central Asia has been always populated by advanced hydraulic societies with improved irrigation systems and sophisticated water distribution systems have been used (Mosello, 2008, p. 152). Therefore, water and water-related issues have always been at the center of attention in the region (Ryabtsev, 2007).

Since water and irrigation have been important driving forces of progress, the management of water resources always required strict implemention of both written and unwritten principles (Dukhovny and de Schutter, 2011, p. 6). These principles were often based on traditions, rules and customs, as well as in the minds of the people.

According to all local traditions, water was never a source of profit in relations between people because water has been recognized as the main basis for the survival and well-being of humanity. Additionally, the farming has 'divine' origins, so people in the region have always considered farming as one of the most honourable occupations.[22]

It has been claimed that Central Asia is one of the most important farming areas of the world, in which the centuries-old culture of farming based on irrigation was discovered (Ögel, 1991, pp. 51-53). As such water management has a long history in the region. It has been indicated that the Khorezm region (in the Amu Darya delta) was the first culture to develop irrigated farming system around the 8th-7th century BC (Dukhovny and de Schutter, 2011, p. 28). Furthermore, when the Iron Age started at the beginning of the 1st millennium BC and iron began to be used in different areas such as constructing, deep and wide irrigation canals were built around the Ferghana Valley (Dukhovny and de Schutter, 2011, p. 28).

As the population increased and the handicraft industry developed, demand for agricultural outputs also increased. In the period between the 4th and the 1st centuries BC, drastic changes were observed in irrigation technologies related to water delivery systems. To illustrate, less than 10 km canals were extended to hundreds of kilometres, such as the construction of the canal in Bazar-Kala (Dukhovny and de Schutter, 2011, p. 29). Another big irrigation canal built at the right-bank of Khorezm was 15 km long with 2,000 hectares of irrigation network.[23]

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[22] The Sharia calls farmers who cultivate their land as '*ashraf-ul-ashraf*' (the noblest among the nobles) (Dukhovny and de Schutter, 2011, p. 6). Also, the Chapter III of Avesta (sacred book of Zoroastrianism) is about farming (Azizi, 2009, p. 64).

[23] Until the Tsarist Russia came, there were mainly 4 types of canals that were constructed under the supervision of an '*usta*' (master) who did not possess any instruments for leveling but his big toe in order to determine the best route (Matley, 1994, p. 267).

- main canals: 5–9 m wide, 2.3–3 m deep
- laterals: 1.5–3.5 m wide, 1.2–1.6 m deep
- sub-laterals: 0.8–1.3 m wide, 0.9 m deep
- field ariqs11: 0.5–0.7 m wide, 0.4 m deep

As was mentioned in the Introduction, historically, there have been different paradigms of water management that can also be applied in Central Asia (Allan, 2003, p. 10). At first, water management in Central Asia was small scale and community based (Abdullaev and Atabaeva, 2012, p. 106). The distribution of water during this era was managed by *mirabs* and by *ariq-aksakals* (Matley, 1994, p. 280).

At this period religion played a prominent role to generate some principles and rules on water use. The Avesta (the Right Way)[24] is mentioned as the first text that claimed statements on water (Dukhovny and de Schutter, 2011, p. 50). According to the Avesta, the universe was divided between two spirits: Ahura Mazda and Angra Mainyu (Azizi, 2009, p. 75). While the former was the envoy of perfection, rationality, and knowledge, the latter created sin, disease, death and similar evils.[25] Since water was considered to be the sacred creation of Ahura Mazda, it had to be protected against pollution. Also, Magis were vigilant guardians and tireless monitors of these sacred instructions (Azizi, 2009, p. 82).[26] That is the reason why concern for water has united states and nations in the region. According to the Chinese Buddhist monk and pilgrim Hsuan Tsang, around the 7th century although the Maverannakhr was politically disintegrated, it was an integrated unit with market towns and fields irrigated by canals in which everbody, regardless of their economic activity, supervised water quality and monitored the

[24] The Avesta (the Right Way) is the sacred text of Zoroastrianism, and comprises a religious code and legal regulations, prayers, psalms and hymns devoted to deities (Azizi, 2009, p. 33). This ancient religion emerged five centuries before Christianity. It is told that Zoroastrianism arose in the middle of the 5th century BC in lands located between the Caspian Sea and the Amu Darya River. Furthermore, the Avesta was regarded as the official code for governance and for social and family life in the region.

[25] This is considered to be similar to God and Satan in Christianity, and Allah and Eblis in Islam.

[26] The role of religion over water also made a moral value for the people in the region. To illustrate, every person in the region believe that who steals water once, remains as a thief for life and people could forgive theft of property or cattle but could not forgive theft of water.

condition of irrigation canals, jointly solving any water problems when necessary (Dukhovny and de Schutter, 2011, p. 51).[27]

The invasion of Arab tribes around the 7th century played a considerable role for the improvement of irrigation in the region because Arabs realized the particular natural conditions of Central Asia and tried to transform this region into a ground for goods and a source of enrichment. Regional development should have relied on expanding irrigation areas and constructing water infrastructure and to achieve this goal they constructed canals in the valleys of the Tigris and Euphrates rivers (Dukhovny and de Schutter, 2011, p. 52). For example, some canals in Tashkent, which remained in operation for more than 400 years until the 18th century, were personally contributed by the Caliph Mutasid.

After the invasion of the Arabs and the introduction of Islam, the issue of water continued to be equally important. This time, however, there was one particular book known as 'The Books on *Ariqs* (The Books on Canals)' written by *faqihs* (jurists).[28] This book became the guide for regulating land and water relations for many centuries in Central Asia (Dukhovny and de Schutter, 2011, p. 53).[29] The book, the statements of which were the interpretation of some verses in Quran related to water[30] preserved the continuity of age-old traditions and stimulated further agricultural development in

[27] The leaders of these domains knew one firm truth: "if you would like peace and prosperity, you should take proper care of joint water use". They also knew that it is impossible to maintain irrigation systems properly without the participation of all inhabitants (Dukhovny and de Schutter, 2011, p. 51).

[28] Jurists who were specialists in Islam jurisprudence were called faqihs.

[29] The first water code has not survived but its regulations were reflected in the Sharia, showing their importance in the development of irrigation in the Muslim world.

[30] Surah Al-Baqarah (12-22, 60, 72-74, 164), Surah Al-An'am (99), Surah Al-A'raf (57, 159-160), Surah Al-Anfal (11), Surah Ar-Ra'd (4), Surah Al-Hijr (22), and such that (Altuntaş and Şahin, 2006).

the region was tackling with five key problems (Dukhovny and de Schutter, 2011, p. 54):[31]

- Dead earth
- Regulation of water use
- *Shif'at* (the preferential right of a neighbor or land co-tenant to acquire land)
- *Muzaraat* (an agreement between two persons on the cultivation of a plot belonging to one of them for a share of the crop yield)
- *Musakat* (an agreement on cultivating orchards or vineyards using payments in kind).

The 9th and 10th centuries are characterized by strong economic growth and the golden age of Central Asia. Farmers cultivated vegetables, wheat, oil-bearing plants, barley, and even cotton.[32] Geographers of the period described the skills of farmers in the oases of Central Asia by appriciating the complicated system of irrigation. There were four main canals running through the town from the Murgab River: the Al-Zork Canal, the Al-Adi Canal, the Hurmus-Kharre Canal, and the Al-Madjan Canal (Dukhovny and de Schutter, 2011, p. 65). However, these canals were gradually ruined because of the destroying conquest by the Mongols. The area of land under irrigation was drastically reduced during the 150-year of Mongol domination (İzgi, 2014, pp. 3-19). Also, agricultural centres such as Sayram and Otar were ruined. According to some

[31] Arabic scientists established a proper system of water distribution based on exact mathematical calculations (which were translated from Arabic into Russian by the Russian colonial administration and later by the Soviet authorities). The works of eminent scholars from Baghdad such as Fath Al-Qodir, Ibn-Abidin and Ash-Sheikh Muhammad Ilyas were also translated into Russian. These works have been carefully studied by modern scientists when developing new irrigated farming systems. In 1924 a special issue of the journal Bulletin of Irrigation was devoted to water legislation. It was issued under the title 'The Collection of Muslim Regulations (Sharia) concerning Water and Land Use', and quoted 205 instructions which covered basic problems of water and land use (Dukhovny and de Schutter, 2011, p. 54).

[32] Although there were cotton plantations in the region before Tsarist Russia, only small parts of all lands were reserved for cotton, with more than 50 % reserved for grain (Smith, 1992). That's why even though history of irrigation dates back to milennia, cotton is more or less a recent phenomenan in the region.

studies, stable areas of irrigated farming fell by more than 1/3 during this period (Valentini, Orolbaev, and Abylgazieva, 2004, p. 19).

The devastating period was ended up by Timur and his heirs Timurids. This is considered an era with significant advances in economics, science, and culture (Dukhovny and de Schutter, 2011, p. 67). Once his military campaigns ended and he achieved absolute power, Timur began to develop his main passion, which was irrigation systems.[33] As Ruy Gonzalez de Clavijo, who was a member of the second embassy of King Henry III of Castile to Timur (1403–1404) stated, considerable progress was made in developing the irrigation systems during this period.[34] 1,400,000 hectares were irrigated in Central Asia at that time (Dukhovny and de Schutter, 2011, p. 67). Indeed, some components of the elementary water infrastructure dating from this period still exist, such as numerous stone structures, bridges, aqueducts and chutes in Samarkand (Glantz, 1999). The death of Timur was followed by a civil war (Hayit, 2004, pp. 1-7). The Shaybanids, which were Uzbek tribes from Siberia, gained victory in this war and came to power. However, they were also defeated in 1510 by Shah Ismail in the Battle of Merv (Hayit, 2004, pp. 8-9). After that time until the invasion of Tsarist Russia, the region was ruled by the Khiva Khanate, the Bukhara Emirate, and the Kokand Khanate.

All rulers, however, took into consideration the necessity of properly maintaining the irrigation systems, constructing new canals and expanding the amount of irrigated arable land. For this reason, they had to adopt certain basic rules and meet obligations, which they had to execute in line with the requirements of the Muslim religion during those period (Dukhovny and de Schutter, 2011, p. 73). Despite some minor differences, the Sharia law was applied throughout the region with its uniform set of

[33] This passion for irrigation, water management, planting of orchards and construction of canals was found in all the Timurids: each aspired to follow the example set by their famous forefather (Dukhovny and de Schutter, 2011, p. 67).

[34] Timur admired vast blooming gardens in the cities of his empire, the seething streams of irrigation canals and the large water reservoirs. Also, there were many canals and orchards all around Termez (Dukhovny and de Schutter, 2011, p. 67).

requirements and as it was mentioned above these set of rules were supervised by *mirabs* and *ariq-aksakals*.

Tsarist Russia established its complete domination over Central Asia in the second half of 19th century, stating the second paradigm of water management in the region (Allan, 2003, p. 13). In 1865, Tashkent was taken and Turkistan Governorship-General was declared. Very soon Russia made plans to transform Central Asia into a huge cotton plantation. The reason behind the idea of cotton production in the region was the civil war in US (1861-1864) which cut the cotton import of Russia drastically and created the necessity of meeting the demand for cotton (Peachey, 2004). Therefore, Russia decided to modernize the system of land and water management relations in the region (Matley, 1994, pp. 266-270). After the modernization process, cotton production in the Ferghana Valley rose from 14 % in 1885 to 44 % in 1915 (Dukhovny and de Schutter, 2011, pp. 101-115). Similar to Ferghana, cotton occupied 25 % of the total irrigated areas in 1909 (Dukhovny and de Schutter, 2011, pp. 101-115).

Initially, the Tsarist Russian government did not make any changes in water management system in the region other than enhancing it because of the resistance of local people to protect the centuries-old traditions (Abdullaev and Atabaeva, 2012, p. 104). But eventually, the government decided to alter the pattern of water management: large-scale irrigation was introduced and subsistence agricultural production was turned into large-scale cotton growing agriculture (Abdullaev and Atabaeva, 2012, p. 104). For this purpose, 'Temporary Rules on Irrigation of the Turkestan Region' was enacted for water management in 1877 (Valentini, Orolbaev, and Abylgazieva, 2004, p. 23). A similar step was taken to institutionalize the land and water relations in the region when Tsar Alexander approved the 'Regulations for Governance of Turkistan Krai' in 1886. According to the Regulation, whole area was declared state property and the arable lands could be operated by private persons.

While these regulations were adopted to change the pattern of irrigation in the region, the only change that took place was about land relations, because now although water in *ariqs*, canals and small rivers that could be used for irrigation of fields belonged to the state, the people had right to use water (Dukhovny and de Schutter, 2011, p. 103).

In other words, people could now utilize the water in the main *ariqs*, streams, rivers and lakes in accordance with the established customs. But the most important part of the regulation was related to the management of main *ariqs* to be implemented by *ariq-aksakals* and *mirabs* as it had always been (Valentini, Orolbaev, and Abylgazieva, 2004, p. 23). In other words, after having discovered that the water sector in the region was very advanced, Tsarist authorities decided not to interfere and granted all responsibilities for water use and management to the local population.[35] For example, the water code for Central Asia (The Turkistan Administration of Irrigation Works) in 1907 included the collection and the translation of the water-related chapters of Sharia (Dukhovny and de Schutter, 2011, p. 107). Besides, by giving credit to prosperous local farmers and the aristocracy, the government sought to improve water intake facilities, construct new irrigation canals and systems, and expand the irrigation area in order to encourage the development of irrigation within oases (Dukhovny and de Schutter, 2011, p. 106). For instance, external *kazu* (public work) was related to the cleaning and repairing of canals and waterworks for general use, and internal *kazu* was related to the cleaning of a person's own *ariqs*. These were the two kinds of public work and they were done by the local people under the leadership of *mirabs* and *ariq-aksakals*.[36]

However, the implementation of water management system required reforming the executive vertical tiers. Therefore, the Tsarist government conducted some projects and centrally-managed operations. To illustrate, engineering field surveys were started

[35] The Director of the Department of Land Reclamation of the Russian Empire, Prince V. Masalsky, admired the status of the irrigation systems in Turkistan and said the following: "Almost all irrigation canals were built by the local population and most of them since times immemorial. Some canals are enormous, and when I looked at these powerful streams that transport the life-bringing water over many tens of versts, involuntarily I had a profound respect for the nation which, while having so scarce engineering resources and in the broiling Turkistan sun, by means of incredible efforts has covered all the land surface with a network of irrigation arteries" (Dukhovny and de Schutter, 2011, p. 105)

[36] *Mirabs* and *aksakals*, as men of authority with a deep knowledge of customs and water supply system, were directly elected by the people and were believed to be capable of acting as mediators in the settling of water disputes and therefore, prevent intra- and inter-clan tensions that could over the use of water.

in 1895 with 600,000 dessiatinas of land in the Syr Darya River. Also around 45,000 dessiatinas in the northeast part of the Hunger Steppe were selected for the Irrigation Phase I Project. Between 1870 and 1895, more than 10 projects were prepared and one small-scale project was implemented in 1895 (Valentini, Orolbaev, and Abylgazieva, 2004, pp. 21-24).[37] Later, in order to supervise all these developments, the government created the Department of Farming and State Properties of the Turkestan Region in 1897 (Valentini, Orolbaev, and Abylgazieva, 2004, p. 23). That's to say, while the traditions in water use were still alive in the region at lower levels, the central government eventually took control to achieve its goal of large-scale cotton production which could not be realized with the current irrigation systems. In order to design and construct improved irrigation systems, the government also decided to construct some canals such as the Monarchic Manor in the Murgab Oasis which was defined as one of the biggest projects in the Tsarist era (Valentini, Orolbaev, and Abylgazieva, 2004, p. 22). The Golodnaya Steppe Irrigation Project (1910–1915) and the Kayrakkum Canal with the irrigation of 516,000 dessiatinas were the other large-scale projects at the time (Dukhovny and de Schutter, 2011, p. 116). In addition, restoration of the Sultan Band in 1887,[38] the Hindu Kush in 1895, the Mirzachol Sahra Canal (known as the Imperator Nikolai I Canal) in 1898, Iolotan Band in 1909, and the Romanovskii Canal in 1913 were other large-scale projects (Matley, 1994, pp. 273-274). As a result of all these, 24 % of the total area was irrigated by 1913.

This era, called the second paradigm of the water management (Allan, 2003, p. 13), would end in early 1920s for Central Asia (Abdullaev and Atabaeva, 2012, p. 106), giving way to the third paradigm after the February Revolution of 1917, which overthrew the monarchy and let the Bolsheviks come to power. In this era (1920s-1940s) establishment of Soviet power in Central Asia was not easy because of the local

[37] The objective was to turn Turkestan into a large exporter of not only cotton, but other agricultural products.

[38]The Band was built in the 12th century but in 1784 it was destroyed along with the city of Merv by the emir of Bukhara, Shah Murad. It was not in use when the Russians arrived (Matley, 1994, p. 270).

resistance movements such as the Basmachi. Nevertheless, all irrigation infrastructures and main canals were transferred to the jurisdiction of the People's Commissariat of Agriculture by the decree issued on March 13, 1918 (Dukhovny and de Schutter, 2011, p. 120). The Soviet government realized how significant it was to rehabilitate irrigation in the region in order to provide a satisfactory level of well-being to the people of region. For that reason, Supreme People's Economic Council prepared a plan for the top-priority irrigation works and submitted it to the Council of the People's Commissars in early 1918. Based on this document, Lenin signed the famous decree 'Allocation of 50 million ruble for irrigation works in Turkistan' in May 1918 (Dukhovny and de Schutter, 2011, p. 120).[39] Besides the decree, report on the electrification of Turkistan was prepared to construct some hydropower plants such as the Boz-Su Hydropower Station Cascade and the Uchkurgan, the Farkhad and the Khishraus hydropower stations. In September 1920 the congress of state farm representatives of the Turkistan Republic was held and in the congress the problems of irrigated farming were discussed and the action plan for the Turkistan Water Administration was adopted.[40]

[39] In accordance with this decree the following irrigation works had to be implemented: 1) irrigation of 500,000 dessiatinas of the Hunger Steppe in Khojent district of Samarkand Province 2) construction of head structures of the irrigation system covering 40,000 dessiatinas in the Dalverzin Steppe located on the opposite bank of the Syrdarya River 3) irrigation of 10,000 dessiatinas in the Uchkurgan Steppe in the Fergana Province and improving water use over an area of 20,000 dessiatinas in the same region 4) construction of the dam on the Zarafshan River (near Dupulin bridge) for regulating the river flow and irrigating about 100,000 dessiatinas for cotton production 5) completing the construction works for irrigation systems in the Chu Valley over an area of 94,000 dessiatinas (Dukhovny and de Schutter, 2011, p. 120).

[40] Main resolutions adopted at this congress as follows (Dukhovny and de Schutter, 2011, p. 122):
1. All water and land resources within the Turkistan Republic, regardless of their current ownership, are national property. 2. The sale, purchase, mortgage and lease of land and water resources are absolutely banned and considered a state crime. 3. Specifying the size of personal plots for working people is the responsibility of the State Land Committee and local authorities with the participation of *dekhkan* (peasant) representatives. [This should] take into consideration the conditions in each agricultural district and the family status. The same principles should be used for distributing water resources. 4. For the purpose of preventing aggressive tendencies, all settlements of Russian settlers created in the process of colonization must be equalized with the native population in respect of their rights regarding land and water

Centrally-planned organizations were continued with the attempts of the People's Commissariat of Agriculture to reorganize the management system, which met at the end of 1922 to review several topics such as the budgetary needs with the employees in the water sector,[41] the construction of regulators and lateral canals to improve water use, hydrogeological and socioeconomic surveys, creation of field schools for water foremen, and the establishment of technical secondary schools to train water technicians (Dukhovny and de Schutter, 2011, p. 124).

While the government tried to organize central plans to develop and modernize the systems, it decided to share the responsibility with local people because establishing its power by integrating existing rules and regulations into the framework of the goals of the regime (as was done by Tsarist Russia) would be an effective method. To establish a clear legislative basis for existing irrigation communities that relied on old traditions, the Soviet government issued a special law in 1921 'On Land Reclamation Associations' (Dukhovny and de Schutter, 2011, p. 125).[42] This law demarcated people into irrigation communities. However, with the demarcation, substantial reform on the water management system took place in the region, such as foundation of the Turkistan Water Administration for the implementation of large-scale survey and design works, and constructing projects. Moreover, on December 2, 1925 separate water authorities in each republic were established to organize the operation and

use. 5. Water rights should be adjusted to the key regulations of land management in accordance with real need. 6. Water rights cease with the discontinuance of land use rights. 7. Maintenance and repair of waterworks and the main irrigation networks are the responsibility of the State, but other water infrastructure should be supported at the expense of water users.

[41] The five-year plan for rehabilitating the water sector to a pre-war level was based on decisions of this meeting.

[42] "For the purpose of legitimate water distribution among farms which divert water from a common canal (ariq) for irrigation of their plots, the population was organized into irrigation communities. These are associations of separate water users. These associations exist only on those ariqs where water use is based on an established sequence of water supply. They have spontaneously arisen and become quite widespread in the Turkmen Province. The number of these associations on one ariq varies depending on the carrying capacity of an ariq and the quantity of farms supplied with water from this ariq within the territorial boundaries of a settlement or community, which is the administrative unit."

maintenance of the irrigation systems and to prepare the land and water reform. In order to expand the cultivation of cotton, radical changes were introduced in the structure of capital investments into the water sector in the region such as the 3 times increase in the federal budget for irrigation in the late 1920s to finance large-scale works like rehabilitation of the Djun and Khan canals, the reconstruction of the Dargom, Palvan, Kurtyk, and Payariq canals, and the construction of the Jilvan irrigation system (Dukhovny and de Schutter, 2011, p. 130). To achieve its goals, the Soviet government included in its First-Five-Year-Plan[43] projects for irrigating larger areas of land in order to expand the cultivation of cotton. During this period such projects were implemented in the Ferghana Valley, the Mirzachol Sahra, the Zarafshan, the Surkhan Darya, the Chirchiq, and the Ahangaran River as a result of which the dependency of the Soviet Union on cotton import was reduced. While in 1927-1928 the Soviet Union imported about 41 % of its cotton requirements, by 1929-1930 this ratio had dropped to 19.3 %, and in 1933 to 2.6 %. Only in Uzbekistan did the cotton production increase from 38 % of total land to 55 % (Matley, 1994, p. 288).

The Second World War damaged the development of the water sector and production suddenly dropped to the level in early 1910s (Matley, 1994, pp. 290-291). However, at the end of the 1940s the significance of Central Asia increased and Soviets considered the region as a 'bread basket' and 'cotton grower' (Abdullaev and Atabaeva, 2012, p. 106). Therefore, the state once again decided to increase cotton production in the region in order to secure the country's 'cotton independence' and attempted to use all the capacity of the river basins (Makhmudov, Makhmudov, and Sherfedinov, 2008, p. 16). The decision started a new era for water management, the fourth paradigm.[44]

[43] It was implemented by Joseph Stalin in 1928-1932. The plan concentrated on developing heavy industry and collectivizing agriculture.

[44] Decrease in the area sown to cotton was from 2.3 million acres (924,000 hectares) in 1940 to 1.8 million acres (720,000 hectares) in 1943. However, the first postwar Five Year Plan that called for a maximum effort to restore cotton production increased the production firstly to 1 million hectare by 1950 and 1.7 million hectares by 1963 with a total production of 3,689,000 metric tons (Matley, 1994, pp. 289-291).

In August 1950, the government adopted a resolution on the transition towards new irrigation systems to improve use of irrigated lands, to replace the permanent field irrigated networks with temporary irrigated ditches, and to increase the level of irrigated lands (Dukhovny and de Schutter, 2011, p. 140). Developing these activities in the post-war period under the fourth and fifth Five-Year Plans (1946–1950 and 1951–1956) were accompanied by enhanced mechanization of construction and repair works, as well as the introduction of machinery for cleaning of the irrigation canals such as the Amu Darya-Bukhara Canal, the Amu Darya-Qaraqol Canal, the Chu Canal in Kyrgyzstan, as well as several reservoirs on the Syr Darya River.

In addition to the decrease in the production, the population had increased drastically (Matley, 1994, pp. 290-300). While at the end of the war the Soviet population was around 150 million,[45] at the 1959 census the Soviet government announced the population as 200 million (Selegen, 1960, pp. 17-27). Therefore, the Soviet government under Nikita Khrushchev launched the 'Virgin Lands' campaign in 1953. The agricultural development of Central Asia was expanded by 88.6 million hectares as a result of the campaign (Peachey, 2004).

However, in the 1960s the Soviet government came to the conclusion that it failed to raise the level of agricultural production and decided to develop irrigated farming in Central Asia (Dukhovny and de Schutter, 2011, p. 142). For this reason, millions of hectares of virgin land had been turned into irrigated land and thousands of kilometres of canals were constructed with dozens of water reservoirs (such as the Bukhtarma Reservoir, the Chardarya Dam, the Shulba Dam, the Toktogul Dam, the Nurek Dam, and many others).[46] In addition, other water infrastructure facilities were constructed

[45] It was not exactly known because of lack of source on it. But the casualities in the war were known as 23 million for Soviet Union and the number equalized the 13 % of population. That gives approximate population of Soviet Union before the war as 170 millions.

[46] During the Soviet era more than 1,200 dams were built in the region (Izquierdo, Stangerhaugen, Castillo, Nixon, and Jimenez, 2010). The dams listed above are the ones with the reservoir capacity above 1 km^3.

so that the water management became part of 'conquest of the nature' (Abdullaev and Atabaeva, 2012, p. 105).[47]

In addition to building dams and reservoirs to increase the production in the region, the Soviet government imposed quotas on the producers (Peachey, 2004). Requirements to maximise the production led to an enormous usage of mineral fertilizers and chemicals, increasing water pollution and resulting in diseases such as tuberculosis, anemia, hepatitis, respiratory problems and throat cancer for the area's inhabitants (Bekturganov et al., 2016, p.5).[48]

During the period of the fifth paradigm (late 1960s to 1980s) cotton production rose to 5.6 million tons from around 2.6 million tons in the 1950s. Tonnage of cotton per hectare in Uzbekistan which had increased from 1.2 in 1913 to 2.0 in 1960, peaked at 2.7 in 1980, an output more than double what it had been 65 years earlier (Peachey, 2004). Besides, the area of irrigated land in the region reached to 6.8 million hectares in 1990 from 4.3 million in 1950 (Petrov, 2010, p. 57). Moreover, whereas the area was producing 370,000 tonnes of agricultural produce annually (with a value of 180 million Russian Roubles in 1980), the production increased to 1.8 million tonnes (with a value of 488 million Russian Roubles) in 1980 (Global Water Partnership, 2014, pp. 11-12).

However, all the developments on the amount of cotton in Central Asia during this era caused one of the biggest environmental disasters in human history: the Aral Sea. Once the 4th largest body of inland water in the world and covering an area of the size of Belgium and Netherlands combined prior to 1960, Aral ended up being the sixth largest inland water (Glantz, 1999). For example, in the 1950s the Aral Sea

[47] The Ministry of Water Resources and Amelioration, which was the main water agency, became the second largest consumer of state funds after the Ministry of Defense.

[48] More than 30 components, including heavy metals, are determined on the Amu Darya and the Syr Darya Rivers. Concentrations of phenols, iron, and zinc, and general mineralization in the lower reaches of the Amu Darya River and the Syr Darya River have been 1.3–4 times higher than the maximum allowable concentrations (MAC). Mean annual mineralization of the Amu Darya River increased almost twice in the last 30 years (Kulmatov, 2007, p. 21).

had a water volume exceeding 1,090 km^3, and a surface area of more than 67,900 km^2 (Chatterjee, 2007, p. 286). The water level in the Aral Sea ranged seasonally between 50 m and 53 m above sea level (Bart, 2013, p. 422). However, in order to increase the cotton production, which was the main agricultural priority for the Soviet regime, the Amu Darya River and the Syr Darya River were diverted by dams and canals. Since the overall water consumption had already begun to exceed the available water resources, return water from drainage started to be used (Asian Development Bank, 2010, pp. 150-163).[49] As a result of this, lesser amounts of water began filling the Aral Sea, causing one of the biggest man-made disaster (Bıyıkoğlu, 2010).[50]

Prior to the Soviet interference, Aral Sea acted as a cultural, economic, and geographical core for the region as the north–south shipping route, the source of an annual fishing catch, and the raw material for cellulose and carton production that were provided from shores (Smith, 1992). Additionally, more than 250,000 hectares of tugay forests in the Amu delta, where migrant birds nested and rare animals lived, were a natural barrier against soil erosion (Chatterjee, 2007, p. 287). However, the cotton cultivation policies of the Soviet administration not only damaged the environment but also caused economic and social disasters such as unemployment and health problems. As a result of the decrease of the volume of water in the Aral Sea, there emerged two water bodies, Southern and Northern Aral Seas, fed by the Amu Darya River and the

[49] The difference has been made up by using return water from drainage such that in the Amu Darya and Syr Darya Basins, 100 %–110 % and 130 %–150 %, respectively, of available water resources are used (Kipshakbaev, 2008, p. 81).

[50] As put forward by some scholars (Jarsjö, Asokan, Shibuo, and Destouni, 2007, pp. 105-106): "The hydrological balance modelling results show that the water losses by evapotranspiration (ET) increased after 1950 mainly due to the irrigation changes, rather than due to the temperature changes, within the Aral Sea Drainage Basin (ASDB). The ET loss increases due to temperature increases alone were found to be smaller than the water gains due to the also increased precipitation over the ASDB since 1950. This means that the net hydrological effect of only the climatic changes within the ASDB would be slightly increased, rather than the observed decreased river runoff. Climate change can therefore not at all have contributed to the dramatic drying of the rivers that has led to the present water scarcity in the basin, at least not so far. The increased ET flux from the considerably expanded irrigated agricultural fields, however, can fully explain the decreased river discharges and the present water scarcity in the basin."

Syr Darya River, respectively (McKinney, 2003, pp. 5-6). Due to the loss of water inflow to the Sea, by the end of 1996 the Sea's total area had decreased by 57 %, though the salt level had increased to oceanic levels, causing all the freshwater fish to die. By 2007 it had declined to 10 % of its original size and split into four different lakes (Jenkins-Young, 2013, p. 6). Aral disaster would be one of the main water-related problems in Central Asia in the post-Soviet era.

Table 1*: Degradation of the Aral Sea*
Source: http://happyplanet.today/the-ecological-disaster-of-the-aral-sea/ (accessed on November 25, 2016)

Even though central planning organizations and ministries in Moscow directed water management in Central Asia during the Soviet era, all republics had their own Ministries of Water Resources (Jalilov, 2010, p. 13). The central government was basically responsible for water management by overseeing construction projects, operation of the infrastructure and allocation of water quotas (Chatterjee, 2007, p. 288), but each republic developed their own plans (McKinney, 2003, p. 1). For

transboundary basins, plans were developed by regional design institutes including inter-republic and multisectoral aspects, as well as allocation of water for various uses. For example, region-wide Basin Water Organizations (BVOs)[51] were established in 1988 in the Amu Darya and the Syr Darya Basins for ensuring water allocations (International Crisis Group, 2014).

During the Soviet rule, the central government did not just take important steps for cotton production, there were also some significant projects to develop hydroengineering. The creation of the Central Asian Experimental Research Institute for Water Management in 1924[52] was considered one of them. The Soviet administration established several projects that would make the Union one of the largest hydroenergy producers in the world such as the Charvak Dam on the Chirchik River, the Farkhad Dam on the Syr Darya River, the Toktogul Dam on the Naryn River, the Nurek Dam on the Vakhsh River and the Tuyamyun Dam on the Amu Darya River (Zorlu and Akıllı, 2015). In addition to them, the Soviet government initiated the construction of Kambarata Dams in Kyrgyzstan and the Rogun Dam in Tajikistan to ensure that electricity was provided to whole region on the one hand, and to provide water for irrigation in Kazakhstan, Uzbekistan, and Turkmenistan on the other hand (Zorlu and Akıllı, 2015).

However, the use of the canals and the uncompleted projects (Kambarata Dams and the Rogun Dam) created problems and sometimes increased the tension among the countries in the region after they became independent. In other words, the system,

[51] They worked in conjunction with Gosplan, the State Planning Committee, which had the final say over all economic life in the Soviet Union and set water quotas and energy barter deals in consultation with ministries, including agriculture, energy, land reclamation and water resources.

[52] Later known as SANIIRI (Central Asian Scientific and Research Institute of Irrigation), this was the 'factory' of scientific personnel and 'bearer' of advanced ideas for the whole region, which was one of the great events in the history of the water sector in Central Asia. One can firmly say that no large hydraulic structure or large-scale project in Central Asia was subsequently constructed without modeling tests done in SANIIRI, where thanks to the intellect and 'golden hands' of scientists and technicians a solid basis was created to deliver scientific and technical progress in the water engineering sector (Dukhovny and de Schutter, 2011, p. 133).

which was managed by Moscow for downstream countries' needs during the growing season (irrigation) and for the energy need of upstream countries during the winter (Jalilov, 2010, p. 13), altered in 1991 because the countries started to follow their own individual interests. To put in a different way, at the former situation the states were closely interdependent in terms of water utilization but since the collapse of the Soviet Union they have been functioning independently. Consequently, the unilateral steps in favor of 'one's own national interest' created the water problem in the region in the post-Soviet era. As expressed by Kai Wegerich (2008), administrational boundaries became national boundaries in 1991 and the states were left with inequitable water allocation limits and a high level of water provision structures interdependences in the region.

2.2. Water Management After 1991

During the Soviet era Kyrgyzstan and Tajikistan, as upstream countries, released water in the irrigation period (spring and summer); in return Uzbekistan, Kazakhstan, and Turkmenistan, as downstream countries, provided coal and natural gas in order to meet the energy needs of Kyrgyzstan and Tajikistan for winter (Eshchanov, Plaat Stultjes, Salaev, and Eshchanov, 2011, p. 1575). This centrally-managed system ended with the collapse of the Soviet Union. Since then, the five independent republics have been in competition for the region's water resources as they redefined their individual priorities. In other words, with the creation of new states with their own national interests, each newly-independent republic started to develop its own discourses over water and water resources (Mosello, 2008, p. 158). Naturally, the goals of the independent states conflict with each other: whereas Kyrgyzstan and Tajikistan want to use the water for energy, the others need it for irrigation.[53] Eventually however, the independent states which had now the opportunity to develop their own water strategies realized that it would be impossible to manage water resources separately in

[53] Sometimes the conflict of interests harmed the countries. To illustrate, Kyrgyzstan stored water due to the drought in summer 2000 and this caused a flood that damaged around 120,000 ha irrigation land in Uzbekistan and Kazakhstan in winter because of excessive release (Yıldız, Çakmak, Yıldırım, and Ekinci, 2014, p. 17).

an effective way and decided to work together (Kleingeld, 2016, p. 25). One such step to that end took place on October 10-12, 1991 when the Ministers of five Central Asian republics held a conference in Tashkent and made a statement that recognized joint action in coordination could help to solve the allocation problem effectively (Volovik, 2011, p. 5).

In February 1992, the Almaty Agreement (Agreement on Cooperation in the Field of Joint Management on Utilization and Protection of Water Resources from Interstate Sources)[54] was signed to preserve the 'energy-water nexus'[55] (Bart, 2013, p. 414). In the agreement, cooperation in water management was defined as a key purpose in order to manage the water resources effectively. The agreement took into account equal rights and responsibilities of the people in the region in terms of rational use and protection of water resources by respecting the existing pattern and principles of water allocation (Sharma, Markandya, Ahmad, Iskakov, and Krishnaswamy, 2004, pp. 25-27).

[54] For English translation: http://www.cawater-info.net/library/eng/l/ca_cooperation.pdf (accessed on July 3, 2016).

[55] 'Energy-water nexus' is a term that refers to 'water-energy allocation scheme' which was established during the Soviet Union period. The Soviet government regulated the use of water by some protocols. The last protocols were 'Protocol No.413 of February 7, 1984' that was for the Syr Darya Basin and 'Protocol No: 566 of March 12, 1987' for the Amu Darya Basin. The former protocol asserted that while Uzbekistan was permitted to use 46 % of water in Syr Darya, Kazakhstan, Tajikistan, and Kyrgyzstan had right to use 44 %, 8 %, and 2 % of water, respectively (Sharma, Markandya, Ahmad, Iskakov, and Krishnaswamy, 2004, p. 8). The later protocol claimed that most of the water in Amu Darya were used by Uzbekistan (48.2 %) and Turkmenistan (35.8 %). Moreover, Tajikistan was supposed to use 15.4 % and Kyrgyzstan used only 0.6 % (Jalilov, 2010, p. 16).

Table 2*: Water allocation according to the Almaty Agreement* (Jenkins-Young, 2013)

Country	Syr Darya Allocation %	Amu Darya Allocation %
Kazakhstan	38.1	0
Uzbekistan	51.7	43.0
Tajikistan	9.2	13.6
Kyrgyzstan	1.0	0.4
Turkmenistan	0	43.0
Total	100.0	100.0

As an executive organ, the Interstate Coordination Water Commission (ICWC)[56] was founded with the same agreement (McKinney, 2003, p. 7). The main aim of ICWC was to strengthen the principle of collective leadership in decision-making process on general issues of regional interstate water management, use and protection and in implementing joint programs related to water resources of Central Asia (Volovik, 2011, p. 5). The decisions of ICWC were implemented by Basin Valley Organizations (BVOs)[57] (Ballyev, 2008, p. 106). In other words, The ICWC sets quotas and the

[56] According to the Decision by the Heads of State of March 23, 1993, ICWC was included in the International Fund for saving the Aral Sea (IFAS) and has the status of an international organisation (Volovik, 2011, p. 5).

[57] BVOs were formed to control the flow of Syr Darya and Amu Darya in 1988 and were allowed to continue after the collapse of the Soviet Union with the following duties (McKinney, 2003, p. 7):

- Development of plans for water allocation to users in the Amu Darya and Syr Darya Basins, water diversions, and reservoir operation modes;
- Water supply to users, including those in deltas and the Aral Sea, according to approved limits for water diversion from transboundary water sources;
- Operation of all major hydraulic structures on both rivers, including reservoirs;
- Measurement of water flow through the main water intakes and across national borders;
- Design, construction, rehabilitation and operation of hydraulic structures, head water intakes, and inter-republic canals;
- Maintenance of water quality in the rivers.

BVOs monitor the process.[58]

On March 26, 1993, the Kyzl-Orda Agreement (Agreement on Joint Activities in Addressing the Aral Sea and the Zone around the Sea crisis, Improving the Environment, and Ensuring the Social and Economic Development of the Aral Sea Region) was signed by all riparian countries.[59] Even though the main goal was the crisis in Aral Sea, the agreement stated rational usage of water resources, international water law principles, and mutual interests of every state in the matters of usage and protection of water resources in the basin (Volovik, 2011, p. 4). The Interstate Council on the Aral Sea Basin (ICAS) was also established with this agreement as the representative organ of the states. The ICAS was intended to be the leading management organization to make decisions on water use and distribution in the region (Dukhovny and de Schutter, 2011, p. 218). Also, as the leading management organization ICAS oversaw the ICWC (Peachey, 2004).

In 1993, Central Asian countries formed the International Fund for the Aral Sea (IFAS) as the leading institution to raise and administer funds that address the Aral Sea crisis (Allahverdiyev, 2015, p. 78). Although the aim of IFAS was to overcome the problems associated with the desiccation of the Aral Sea, with the 'Program of Concrete Actions' that was approved by the Presidents in the following year, some attempts for efficient water managements were also taken such as water sharing among the countries, rational water use, conservation of water resources in the basin, and interstate legal acts on the use and protection of water resources (McKinney, 2003, p. 8).

[58] BVOs shall act as the executive and interdepartmental organs of the Interstate Co-ordination Water Commission, and shall function on the condition that all structures and facilities on the rivers and the water services belong to the corresponding republic and are deemed transferred for temporary use without the right of transfer and redemption (Dukhovny and de Schutter, 2011, p. 218).

[59] Translation: http://www.cawater-info.net/library/eng/l/kzyl-orda_agreement.pdf (accessed on July 3, 2016).

As one of the main activities of IFAS, the Aral Sea Basin Program (ASBP) was launched in 1994. ASBP-1,[60] which was made up of 9 key programs[61] and 19 projects, was prepared and presented to the international donors at the meeting in Paris in June 1994 and the World Bank was appointed as the responsible agency for coordination and monitoring (Dukhovny and de Schutter, 2011, p. 226). With the restructuring of the institutional framework in 1997 by all riparian states, the program was considered a major factor in improved cooperation in the basin (Bozdağ, 2012, p. 7). Water management which was described as the centrepiece of the program in the region, was necessary in four core areas: water quantity and quality; water storage and control facilities; water use; and irrigation and drainage infrastructure (The World Bank, 1998, p. 6).[62]

Another important step in terms of the post-Soviet era water management strategies was taken regarding the Toktogul Reservoir. This reservoir, designed and operated by the Soviet regime, was the largest in the Syr Darya Basin with 14 km^3 storage volume (Sievers, 2002, p. 372).[63] Since the supply of fuel and electricity to Kyrgyzstan from

[60] The second phase of ASBP started on October 6, 2002 in October for the period 2003-2010 to tackle environmental, socioeconomic, water management and institutional problems. The third phase of ASBP covered the period 2011-2015. For detailed information https://www.unece.org/fileadmin/DAM/env/water/cadialogue/docs/Background%20paper_May_Eng.pdf (accessed on June 22, 2016); https://www.unece.org/fileadmin/DAM/env/water/npd/Aral_Sea_Basin_Program_%E2%80%93_III_and_synergies_with_the_NPDs_on_IWRM._Demessin_Nurmaganbetov.pdf (accessed on June 22, 2016).

[61] Some of the programs related to water management were regional water resources strategy, improvement of water management efficiency, dam safety and reservoir management, and upper watershed management (Dukhovny and de Schutter, 2011, p. 222).

[62] The other problems are as follows (The World Bank, 1998, p. 2):

- environmental degradation, with the increase in land and water salinization the gravest problem;
- the gradual drying up of the Aral Sea, with huge adverse socio-economic and environmental effects;
- instruments for interstate cooperation, with the commitment of sovereign states the big challenge.

[63] Before 1991, surplus power generated by irrigation releases in the growing season (April-September) by the Toktogul system was transmitted to neighboring regions of the Soviet

Uzbekistan and Kazakhstan was reduced after independence due to the complications in intergovernmental relations and growing prices of oil, coal, natural gas and transportation, Kyrgyzstan decided to use the reservoir for power generation to meet the energy demand (McKinney, 2003, p. 9). The intensive water use along with the changes in the operating regime created serious challenges for the downstream Kazakhstan and Uzbekistan.[64] To overcome these problems in the Syr Darya Basin, the related countries signed interstate protocols and agreements in early 1995. Via the agreements, the countries established the Executive Committee of the Interstate Council of the Central Asian Economic Community (EC CAEC) to monitor this arrangement (Kasymova and Baetov, 2010, p. 37). A year later, the community would form a 'Water and Energy Uses Round Table'[65] to develop a framework agreement addressing the Syr Darya Basin riparian countries competing uses for water (McKinney, 2003, p. 9).

The next step was taken on March 3, 1995 when the presidents of all the Central Asian republics signed a joint declaration at the summit in Dashkhovuz (Dukhovny and de Schutter, 2011, p. 3). While this declaration, too, was devoted to the problems of the Aral Sea, it contained the following statement regarding the importance of mutual respect on water issues:[66]

> We, Presidents of Turkmenistan, the Republic of Kazakhstan, Kyrgyz Republic, the Republic of Uzbekistan, having gathered in Dashkhovuz for the annual meeting devoted to problems of the Aral Sea and having conducted bilateral and multilateral negotiations, DECLARE: At present our Region is living through an important, crucial moment in our history. … Based on the importance of the current moment, being conscious of our responsibility for

Union. In return, these regions sent electric power and fuels (natural gas, coal and fuel oil) for Kyrgyzstan's two thermal power plants for winter heating needs (McKinney, 2003, p. 9).

[64] Kyrgyzstan's actions negatively affected Uzbekistan's agriculture and resulted in about $700 million (US dollars) lost in crop production (Jalilov, 2010, p. 17).

[65] The Table resulted an agreement that created a framework addressing trade-offs between the competing uses of water for energy and agricultural production in the Basin (McKinney, 2003, p. 9).

[66] Translation: http://gis.nacse.org/tfdd/tfdddocs/545ENG.pdf (accessed on July 3, 2016).

> the present situation and future of peoples of our countries, we confirm that equitable cooperation, good neighborhood relations and mutual respect will become fundamental principles of our policy toward each other. … Peoples living in this region are united by common historical and cultural heritage, ages old traditions and moral values. They have always been living together in a spirit of mutual respect, peaceful disposition and good neighborly relations. Along with common spiritual values we are also united by traditional trade and other economic ties based on energy, water and other natural resources of the region... We declare of our willingness to by all means assist to establishment a favorable climate for close cooperation among other countries in political, trade and economic, scientific and technical, cultural and humanitarian areas.

In addition to these measures, the Nukus Declaration that was accepted in 1995 focused the sustainable development of Aral Sea Basin and confirmed the desire of the states to strengthen the regional water management (Bart, 2013, p. 419).[67] This declaration, giving support of the international agreements such as the Rio Declaration, claimed that all the riparian countries agreed with each other to recognize earlier signed agreements, contracts, and other statutory acts regarding water resources (Petrov, 2010, p. 53).

Moreover, on February 28, 1997, the presidents of Central Asian states adopted the Almaty Declaration recognizing that water resources management of transboundary rivers should be carried out by the fair and reasonable image, confirming the previously accepted obligations on full-scale cooperation on international and interstate levels (United Nations, 2000).[68]

However despite these agreements, in time conflicts of interest started to emerge among Central Asian countries. The energy-rich downstream countries decided to set the price of natural gas and oil on the basis of international market prices making Kyrgyzstan unable to pay energy voucher (Yıldız, 2014). In response, Kyrgyzstan changed the water storage period and started to run its hydropower plants in winter of 1997 in violation of the Almaty Agreement of 1992 (Sojamo, 2008, pp. 80-81). As a

[67] Translation: http://www.cawater-info.net/library/eng/nukus_declaration.pdf (accessed on July 3, 2016).

[68] Translation: http://www.cawater-info.net/library/eng/almaty_declaration.pdf (accessed on July 3, 2016).

result of this unilateral attempt, less water reached to the downstream countries during the irrigation period and in winter time floods were seen. Therefore, Uzbekistan deployed 130,000 troops near the Toktogul reservoir, to conduct military exercises in 1997 (Votrin, 2003).[69] In this period, also, Uzbekistan continuously threatened Kyrgyzstan to break the barter agreement on gas deliveries. According to experts, this was the first time in the basin interaction when the states utilized their natural resources as a strategic leverage. In other words, they adopted a resource capture strategy to support their unilateral political and economic agenda (Sojamo, 2008, p. 80).[70]

On March 17, 1998, the Bishkek Agreement on use of water and energy resources of the Syr Darya River Basin was signed between Kyrgyzstan, Uzbekistan, and Kazakhstan in order to decrease tensions (Wegerich, 2008a, p. 124).[71] According to the agreement, Kyrgyzstan receives 1.1 million of kWh of power in electricity or coal, valued at $22 million, and 400 million kWh of power plus 500 million m^3 of gas, valued at $48.5 million, from Kazakhstan and Uzbekistan respectively (Chatterjee, 2007, p. 297). In return Kyrgyzstan delivers 3.25 km^3 of water from the Toktogul Reservoir in monthly flows and 1.1 billion kWh of summer hydroelectric power to both Kazakhstan and Uzbekistan (Chatterjee, 2007, p. 297).

On March 26, 1998, all Central Asian republics except Turkmenistan declared their intention to adopt the UN Special Programme for the Economies of Central Asia

[69] 1997 is accepted to be the first time when the parties were on the verge of war because of water.

[70] Using the natural resources as a leverage continued. For example, In 2010, Kyrgyzstan diverted the flow of the Talas River, which is a source of irrigation for Kazakhstan because the latter closed the border between two countries following uprisings and instability in Kyrgyzstan but just a few hours after the river had been diverted, Kazakhstan re-opened the border (Pederson, 2012). In 2012, Uzbek President Islam Karimov told that that if Tajikistan and Kyrgyzstan continued to use water as leverage in the region, war could begin (Savintsev, 2014).

[71] Translation: http://www.cawater-info.net/library/eng/l/syrdarya1998.pdf (accessed on July 6, 2016).

(SPECA) in Tashkent.[72] In the declaration 'rational and effective use of energy and water resources of Central Asia' was recognized as one of the prioritized objectives of the states.

The Amu Darya River Basin Agreement that codified energy for water swaps were instituted by the Amu Darya riparian states in 1998. According to the agreement, Tajikistan exports 3.4 billion kWh ($170 million) of hydroelectric power to Uzbekistan. In exchange, Tajikistan imports 3 billion kWh ($130 million) of electricity per year from Uzbekistan in the form of natural gas (Chatterjee, 2007, p. 298).

In April 1999, the riparian countries announced the Ashgabat Declaration to implement the 'Water Resources and Environment Control Project' (Chatterjee, 2007, p. 296). According to the declaration, the project was "directed to radical improvement of the water and other resources usage, enhancement of efficiency and culture of the nature use within the region, and normalization of ecological situation as a whole."[73]

The Regional Environmental Centre for Central Asia (CAREC) that was founded in 2001 in accordance with the decision of the 4th Pan-European Conference (held in 1998). The goal of CAREC was to solve the problems related to environmental issues, sustainable development, and natural resource management. Moreover, one of its projects was the "development of recommendations as to practical application of international conventions on transboundary water and energy resources use in Central Asia". Workshops were held in Kazakhstan and Uzbekistan on the practical application of current provisions of International Law to transboundary watercourses (Ryabtsev, 2007).

In 2001, all riparian countries declared the Dushanbe Declaration that affirmed the earlier approved decisions on effective use and protection of water resources of the

[72] Translation: http://www.cawater-info.net/bk/water_law/pdf/tashkent_speca_e.pdf (accessed on July 6, 2016).

[73] Translation: http://www.cawater-info.net/library/eng/ashgabat_declaration.pdf (accessed on July 6, 2016).

Aral Sea Basin.[74] Also, with this declaration the interests of all countries were taken into consideration by observing the principles of good-neighborhood and mutual respect. The Dushanbe Declaration improved monitoring and information exchange on water and other natural resources for the purpose of timely and correct decisions on their rational use (Bart, 2013, pp. 419-420).

As mentioned above, in 1998 Kyrgyzstan as an upstream country agreed on water allocation with Uzbekistan and Kazakhstan but the statement in the Bishkek Agreement had been broken several times by the parties. For example, whereas Tashkent could not provide aforementioned amount of natural gas to Kyrgyzstan, Kazakhstan could not supply enough coal (Yıldız, 2014). Moreover, during the same period Kyrgyzstan claimed that it covered all costs of maintenance of the dams but the income coming from the cotton cultivated with water it provided only goes to the downstream countries (Valentini, Orolbaev, and Abylgazieva, 2004). For this reason, Kyrgyzstan wanted the cost to be shared among the all riparian states. This request, however, was rejected by dowstream countries. Hereupon, the Kyrgyz government issued a law in June 2001 that asserted water as a national property (Izquierdo, Stangerhaugen, Castillo, Nixon, and Jimenez, 2010).[75] With the law, Kyrgyzstan began to ask for payment from Kazakhstan and Uzbekistan for the use of water (Wegerich, 2008a, p. 124). Even though both Kazakhstan and Uzbekistan criticised the law, Kazakhstan and Kyrgyzstan held a meeting to discuss the issue. As a result of the meeting, the parties signed a treaty that solved the cost-sharing problem between

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[74] Translation: http://www.cawater-info.net/library/eng/dushanbe_declaration.pdf (accessed on July 6, 2016).

[75] 'Law on the Interstate Use of Water Objects, Water Resources and Water Management Installations' was adopted on June 29, 2001. With the law Kyrgyzstan acts on the basis of the following principles (Petrov, 2010, pp. 53-54):

- Recognition of the right of the state to ownership of the water bodies, water resources, and water facilities within its state borders;
- Recognition of water as a natural resource and economic commodity which has its own economic value in all competing forms of water use;
- User pays principle in interstate water relations

For English translation http://www.cawater-info.net/library/eng/l/kyrgyz2001.pdf (accessed on July 11, 2016).

them. Then, in 2002 the parliament of Kazakhstan ratified the treaty[76] in order to share the costs in maintaining water control installations on Chu and Talas rivers (Sievers, 2002, p. 398).[77]

In March 2002, another similar agreement was signed between Kyrgyzstan and Uzbekistan to share the costs (Dadabaev, 2016, p. 77). Later, in 2009 all downstream countries agreed to share the costs related to transboundary water regulation, including Turkmenistan (Fedorenko, 2015). Moreover, it should be noted that Tajikistan and Uzbekistan had signed an 'Agreement for Cooperation in the Rational Use of Water and Energy Resources' only a day ago when Kazakhstan ratified the treaty (Sievers, 2002, p. 398).

ICWC prepared draft statutes for an interstate water and energy consortium that would be established as a body capable of providing advanced mechanisms for financing and supporting mutually profitable water-energy barter policies between riparian countries (Dukhovny and de Schutter, 2011, p. 294). The consortium which were supposed to be organized as a union of participants for the exchange of water and energy resources was adopted by all parties in July 2004 under the coordination of the World Bank.

In November 2004, Turkmenistan and Uzbekistan signed a 'treaty of friendship' that covered several agreements on water resources, energy cooperation and demarcation of the disputed mutual borders (Fedorenko, 2015). In 2005, UNDP recommended in its report that it was a necessity to establish a regional 'Water-Energy Consortium' to manage water and energy resources for sustainable development. The same year, the Central Asian countries attempted for setting up a water and energy consortium (WES)

[76] The treaty known as Chu-Talas Agreement was signed by the parties in January 2000 (Bure, 2008, p. 131).

[77] The director of *Kazhydromet* (National Hydrometeorological Service of the Republic of Kazakhstan), Dr. Tursynbek Kudekov expressed in an interview that they should not have paid for water but for the services and the Kazakhs have agreed to pay Kyrgyzstan some US$100,000 a year for the maintenance of these facilities (International Crisis Group, 2002). On July 26, 2006, Kazakhstan and Kyrgyzstan also formed the Chu-Talas Commission and the bilateral agreement is defined as the best practices on transboundary water so far in the region (Libert, 2008, p. 39).

to advance Integrated Water Resources Management (IWRM) which was established to build capacity of the region on sustainable water use in 1996 (Izquierdo, Stangerhaugen, Castillo, Nixon, and Jimenez, 2010).

In February 2009, Tajikistan and Uzbekistan signed an agreement for cooperation on gas, electricity and water. With this agreement electricity shortage in significant parts of Tajikistan was solved. There had been lack of electricity in Tajikistan since December 2008 because Uzbekistan had stopped the electricity transfer from Turkmenistan to be carried to Tajikistan. With this agreement, Tajikistan readjusted its timetable for payment of $16 million debt for Uzbek gas, and accepted watersharing management in the northern part of Tajikistan (Fedorenko, 2015).

Despite all these attempts of cooperation in water management, however, there have not been concrete developments in Central Asia and there emerged several problems in implementing treaties. Therefore the problem in Central Asia is not related to lack of common understanding or agreement; the problem is about failures in implementing the signed treaties. According to Dukhovny and de Schutter (2011, p. 279) the Syr Darya Agreement in 1998 created specific problems for suitable water use in the basin because of its limited mandate, its only focus was barter relations between upstream Kyrgyzstan and downstream countries. Furthermore, Mosello (2008, p. 162) states that since the headquarters of the IFAS and the ICWC are located in Uzbekistan there are many doubts on the objectivity of the decisions taken by these organizations on water resources. When evaluating the projects of the ASBP, Dukhovny and de Schutter (2011, p. 279) also assert that the projects were not effective enough due to the weak institutional capacity. Lack of enforcement which weaken the effectiveness of treaties is another reason of the failure as declared by Izquierdo and her collegues (Izquierdo, Stangerhaugen, Castillo, Nixon, and Jimenez, 2010). Insufficient financing is another main concern of scholars, such as Strickman and Porkka (2008), Peachey (2004), and Libert (2008, p. 37). For other scholars the main problem is lack of confidence among the Central Asian leaders (Yıldız, Çakmak, Yıldırım, and Ekinci, 2014, p. 8). Sometimes different expectations of countries result in failure. For example, while Kyrgyzstan and Tajikistan expected the consortium which was established in 2004 to

fund the hydropower generation projects, Kazakhstan and Uzbekistan evaluated the consortium as the mechanism to regulate annual water regime (Dukhovny and de Schutter, 2011, pp. 296-298).[78]

In short, despite the many agreements that have been signed by the regional countries since 1991 such as the Almaty Agreement (1992), the Nukus Declaration (September 1995), the Almaty Declaration (1997), the Ashgabat Declaration (1999), the 2002 Dushanbe Declaration, as well as the involvement of many international organizations and development of many programs such as ICWC, BVO, IFAS, and ASBP, the problem of water management still continues.

As a result, the debates over water and water-related issues have become perennial in the region. That is the reason why Erica Manat evaluated the water summit in 2009 as stalemate-ended (Manat, 2009). Umida Hashimova (2009, pp. 6-7) summarizes the situation of Central Asian republics as follows:

> To escape from the annual disputes and to have an independent energy infrastructure, Tajikistan and Kyrgyzstan are planning to build more dams to produce electricity both to meet their own energy demands and sell it to Pakistan, Iran, and India. The three downstream countries are opposed to this idea, because their economies heavily rely on cotton, wheat and rice, which without the water coming from the upstream countries will be impossible to grow. Thus, at the moment the Central Asian countries are locked in seemingly endless disagreement. Attempts to resolve the issue since 1991 so far failed. In the framework of regional water management four intergovernmental treaties were signed and one draft agreement was prepared. The provisions of the treaties have failed to resolve the real issues or remained paper agreements only.

Patricia Wouters (2013, p. 9) notes that there are still many problems regarding the sustainability of water in the region:

> While most of the region's shared waters are managed on the basis of international treaties, cooperation across such vast basins with diverse political and economic interests continues to be a real challenge. The numerous

[78] The consortium was supposed to act as an insurance agency that organizes and implements a financial mechanism in order to solve problems which were related to the shortage of funds to buy electricity and fuel resources to compensate for water delivery and that can guarantee timely payments (Dukhovny and de Schutter, 2011, pp. 296-298).

> agreements concluded in the Aral Sea Basin suffer from inadequate implementation, although regional institutional mechanisms play an important role in promoting joint activities. The ongoing controversies over hydropower projects between upstream and downstream state, and external involvement in transboundary water issues significantly influence the way in which the water resources of the basin are managed.

To conclude, it is possible to argue that since water started to be called national property, it has become a domestic security concern for Central Asian countries. As mentioned earlier, with the end of the Cold War 'securitization of water resource management' became a very sensitive issue in terms of the transition from traditional security to non-traditional security (Buzan, Waever, and de Wilde, 1998, pp. 23-24).[79]

When we look closer at the water management problems in the region between the upstream countries of Kyrgyzstan and Tajikistan and the downstream countries of Uzbekistan, Turkmenistan, and Kazakhstan, we see hydropower projects to be at the root of these problems. In the next two chapters the tensions between Uzbekistan and Tajikistan about the Rogun Dam on the Amu Darya River and the tensions between Kyrgyzstan on the one hand and Uzbekistan and Kazakhstan on the other about the Kambarata Dam-1 on the Syr Darya River will be analyzed.

[79] The water-related issue did not only create problems between upstream and downstream countries but also among the downstream countries themselves. For example, the huge Project of Turkmenistan, *the Altyn Asyr Lake* (Golden Age Lake) initiated in October 2009 as the symbol of revival of the Turkmen land (Stone, 2008, p. 1002), was harshly criticized not only by the presidents of Kazakhstan and Uzbekistan but by experts and scholars in the region. Uzbek experts had urged that the lake might become 'the latest man-made disaster to hit the region' (Baizakova, 2013, p. 13). Mels Eleusizov, the leader of the Tabigat movement in Kazakhstan characterized the Project as a 'risky venture' for the region (Pannier, 2004). Even Timur Berkeliev, the Head of the World Wildlife Fund in Turkmenistan, stated that there was no sense in this Project (Baizakova, 2013, p. 14).

CHAPTER 3

ROGUN DAM

As mentioned earlier, the Soviet government did not only promote cotton cultivation in Central Asia although it was the priority, but also took some steps to develop hydropower engineering. In order to achieve the goal of being the largest hydropower producer in the world, some important hydropower plants had been established during the Soviet era such as the Charvak Dam, the Farkhad Dam, the Toktogul Dam, the Nurek Dam and the Tuyamyun Dam (Zorlu and Akıllı, 2015). Besides, the Soviet Union initiated the construction of another plant that is the main topic of this chapter: the Rogun Dam on the Amu Darya. The Rogun Dam was initiated by the Soviet government but could not be completed before the collapse of the Union. So, the Rogun Dam had to be completed by the upstream Tajikistan after independence, but Uzbekistan, the downstream country on the Amu Darya, was against the project and has continued to be against it since then. In other words, this uncompleted dam has created problems between Tajikistan and Uzbekistan.

This chapter will analyze the problems related to water management between the mentioned countries and try to answer this question: How does the Rogun Dam on the Amu Darya River affect the relations between Uzbekistan and Tajikistan? In this chapter, some other important topics will also be analyzed: When the Rogun Dam project started, what is the physical capacity of the dam, why did Tajikistan want to restart the project after several years, and to what extend will Uzbekistan be affected from the dam?

However, before analyzing how the dam affects the relations between Uzbekistan and Tajikistan, it is better to understand why water is so important for these two countries. In other words, how they see water and what do they use water are different. Therefore,

some data on Tajikistan and Uzbekistan as well as important water-related issues for them will be given before the impact of the Rogun Dam on the relation between Tajikistan and Uzbekistan is analyzed.

3.1. Tajikistan

Tajikistan is the only non-Turkic republic in the region, surrounded by Kyrgyzstan, Uzbekistan, Afghanistan, and China. The country has 144,000 km^2 land and its population is around 8.5 million (CIA, 2016d). Despite lack of oil and natural gas, Tajikistan is the third largest producer of hydropower in the world thanks to its control over almost 83 % of the water on the Amu Darya. 90 % of its energy is produced from hydropower plants because 93 % of its total area is mountainous and more than half of its territory lies at a height of at least 3000 m above the sea level (Carius, Feil, and Tänzler, 2003, p. 16). Furthermore, Tajikistan has 1,300 natural lakes with a total water surface area of 705 km^2 and a total capacity of approximately 50 km^3 (Frenken, 2013, pp. 151-152).[80] However, since the main export good, that is aluminum, consumes 40 % of electricity, Tajikistan have faced severe winter energy shortages since independence (Zorlu and Akıllı, 2015). For instance, in winter especially rural areas of the country experience energy deficit of up to 2.5 billion kWh (Akhmetkaliyeva, 2016).[81] To put it in a different way, the country in winter is not able to provide electricity more than one hour a day to a good majority of its population (International Crisis Group, 2014).

As will be elaborated in this chapter, while Tajikistan has almost doubled its hydropower capacity since 1991 (Granit et al., 2010, p. 20), the energy crisis in 2008-2009 led the country to relaunch the Rogun Dam project. Although Uzbekistan mentioned its objections and sometimes has threatened Tajikistan with probable water-

[80] Some 78 % of the lakes are in the mountainous areas over 3,500 m above sea level. The largest lake is Karakul, which is in the northeast at 3,914 m, with a surface area of 380 km^2 and a volume of 26.5 km^3. The Sarez Lake with 86.5 km^2 surface area and a volume of 17.5 km^3 is the second largest lake (Frenken, 2013, p. 152).

[81] According to some other estimates, the electricity shortage of Tajikistan is around 5 billion kWh per year (Kleingeld, 2016, p. 27).

induced conflicts, Tajikistan has not retreated and kept working on this project. The president of Tajikistan Emomali Rahmon pointed out that the country was in an energy crisis and that Tajik people had experienced difficult days due to lack of electricity over years so there was no other solution than to complete the Rogun Dam (Zorlu and Akıllı, 2015).

Even though it has been claimed that the Rogun Dam initiative of Tajikistan will worsen the relations of this country with Uzbekistan, some experts state that Tajikistan uses only less than 4 % of its hydropower capacity and it could provide cheap and clean energy to meet its own demands and for Central Asia as well, if the whole capacity was utilized (OSCE, 2015, p. 16).[82]

3.2. Uzbekistan

Located at the hearth of Central Asia, Uzbekistan is surrounded by Turkmenistan, Kazakhstan, Kyrgyzstan, and Tajikistan and shares border with Afghanistan in the south. Its total area is around 480,000 km^2 and it has a population of approximately 30 million people (CIA, 2016c). Uzbekistan has a variety of resources such as natural gas, oil, gold, and silver. To illustrate, hydrocarbon exports (primarily natural gas) establish almost 36 % of all exports in the country.[83] Moreover, Uzbekistan is the 9th largest gold and the 7th largest uranium producer in the world.[84] In addition to such natural resources, agriculture has always played a significant role in Uzbek economy. According to some estimates, agriculture makes up nearly 20 % of the country's GDP and creates jobs for 26 % of its population (CIA, 2016c).[85]

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[82] Tajikistan has the potential to produce nearly 4 % of the world hydropower energy (Jalilov, 2010, p. 33). Moreover, in terms of hydropower potential per capita in the world the country is the 8th (Akhmetkaliyeva, 2016).

[83] Uzbekistan has 12.7 % of all hydrocarbon fuels in the region (Kasymova and Baetov, 2010, p. 31).

[84] In 2012, 90 tons of gold were produced in Uzbekistan and 2.2 tons of uranium are produced annually, all of which is exported (Bertelsmann Stiftung, 2016b, p. 23).

[85] There are a variety of different numbers on this issue. For example, while one study claims that some 25 % of Uzbekistan's GDP is derived from agriculture with about 44 % of the

There are also several different agricultural products in Uzbekistan such as fruits, vegetables, and grain but none of them is as important as cotton; i.e, white gold.[86] Uzbekistan as the 6th largest cotton producer and the 4th largest exporter in the world, use almost 35 % of its land to cultivate cotton (Muradov and Ilkhamov, 2014, p. 11).[87] Cotton is also important for economy because one-third of income of Uzbekistan comes via cotton export (Jalilov, 2010).[88]

Cotton is very significant for Uzbek economy but in order to produce cotton the country depends on its neighbors as Uzbekistan does not have enough water for irrigation and it needs to provide it from outside. According to some studies, 'water dependency ratio'[89] of Uzbekistan is almost 80 % (FAO, 2014).[90] Therefore, this dependency makes Uzbekistan more vulnerable and concerned about the transboundary water resources. In other words, if sufficient amount of water cannot be provided, the economy of Uzbekistan might be severely affected. In this context, Uzbekistan has been emphasizing its objections and concerns on transboundary water

population working in that sector (McKinney, 2003, p. 16). In another study it is stated that the numbers are 33 % and 45 % respectively (Sharma, Markandya, Ahmad, Iskakov, and Krishnaswamy, 2004, p. 3).

[86] In Uzbekistan, more than 60 % of the land is used for agricultural needs (Kulmatov, 2007, p. 20).

[87] In some studies the numbers are different. To illustrate, one source asserts that Uzbekistan is the 5th largest exporter of cotton (http://www.cottoninc.com/corporate/Market-Data/MonthlyEconomicLetter/pdfs/English-pdf-charts-and-tables/World-Cotton-Production-Bales.pdf (accessed on June 11, 2016) but another source states that it is the 3rd largest producer and 2nd largest exporter (Yıldız, 2014).

[88] Cotton makes up more than 20 % of all exports of Uzbekistan (Granit et al., 2010, p. 22).

[89] The dependency ratio is the indicator of the percent of total renewable water resources originating outside the country. For example, if the dependency ratio is equal to 0 %, it means that the country has enough water. However, if dependency ratio of country is 100 %, that means all its renewable water are from outside.

[90] Uzbekistan uses almost 6 times more water than available water resources (Jalilov, 2010, p. 20). To put it in a different way, although it has only about 10 % of the region's total water resources, it consumes approximately 54 % of these resources in the region (Strickman and Porkka, 2008).

resources of the Amu Darya and the Syr Darya. For example, in 2012 Islam Karimov expressed that upstream countries had to consult international experts before they make any change on how to use rivers (Zorlu and Akıllı, 2015). In the official website of Foreign Ministry of Uzbekistan these concerns are clearly stated:[91]

> The Aral Sea basin is supplied with water from the flow of Amu Darya and Syr Darya. In this regard, Uzbekistan cannot but be concerned with the plans of Tajikistan and Kyrgyzstan to construct the new large hydropower stations with gigantic on a global scale dams, i.e. the Rogun Hydropower Station with a 350-meter high dam in the upstream of the Amudarya River and the Kamabarata-1 Hydropower Station with a 275-meter high dam in the upstream of the Syrdarya River.

In the next part of the chapter, the Rogun Dam, which creates highest tension between Uzbekistan and Tajikistan in terms of water-related issues is analyzed.

3.3. The Rogun Dam

As mentioned above, the Rogun Dam was initiated by the Soviet government but remains unfinished because of the dissolution of the Union. In this part, first some descriptive information on the Amu Darya where the dam is constructed, and then the history of the Rogun Dam are given.

The Amu Darya with a total discharge of nearly 80 km³ is the largest river in Central Asia (Olsson, Bauer, Ikramova, and Froebrich, 2007, p. 279).[92] The Amu Darya flows around 2,540 km with catchment area of 534.739 km² (Bart, 2013, p. 413). The formation of it is the confluence of many headwater tributaries but mainly the Vakhsh River and the Pyanj River (Asian Development Bank, 2010, pp. 68-91). As shown in the Table 3, the Pyanj River originating at the glacier in the Vakjdjir Pass, which is located between Afghanistan and Tajikistan, contributes 45 % of the Amu Darya, whereas the Vakhsh River arising in Pamir Alai, which is in the southeast part of Kyrgyzstan, has 25 % of contribution. The usage of these rivers are different. While

[91] http://www.mfa.uz/en/cooperation/aral/1406/ (accessed on June 11, 2016).

[92] The total mean annual flow of all rivers in the Aral Sea Basin is estimated to be around 116 km^3. In other words, the Amu Darya provides approximately 70 % of the total amount of water of the Aral Sea.

the role of the Pyanj River is to support irrigation, the Vakhsh River is mainly used for energy generation such as the Rogun Dam (Olsson, Bauer, Ikramova, and Froebrich, 2007, pp. 279-280).

Of around 70 million people living in Central Asia, the Amu Darya Basin hosts almost 50 million people, all of whom need water for their own needs. While Uzbek people use water basically for irrigation purposes, Tajik people want to solve their energy deficit problem, especially during winter. Therefore, these different and clashing interests that had been reconciled with a plan known as 'water-energy nexus' during the Soviet era, became more problematic after the collapse of the Soviet Union (Bart, 2013, p. 415).

Table 3*: Formation of Amu Darya* (Jalilov, 2010, p. 10)

As mentioned previously, water management has a deep history in the region but the conflict over water is relatively more recent. It started with the Soviet cotton production policy; i.e. cotton monoculture. In the late 1920's, the Soviet government

constructed massive irrigation networks to increase cotton production, a goal it achieved (Bart, 2013, p. 422). For example, while in 1927-1928 the Soviet Union imported about 41 % of its cotton requirements, by 1929-1930 this ratio had dropped to 19.3 %, and in 1933 to 2.6 %. Only in Uzbekistan did the cotton production increase from 38 % of total land to 55 % (Matley, 1994, p. 288). Therefore, since the lands on which cotton was produced had been increased, needs of water raised dramatically as well. To illustrate, today 53 km^3 of water resources of the Amu Darya are consumed for irrigation.[93] Since cotton was produced by the downstream countries such as Uzbekistan, their dependence on water for irrigation has dramatically increased. However, upstream countries such as Tajikistan, also, needed water for their own purposes after independence. To meet their particular demands, Central Asian countries made some agreements regarding the Amu Darya and tried to regulate water flows. However as some scholars claim, independence gave these countries the opportunity to use their natural resources as leverage, resulting in a situation of 'no permanent solution' (Jenkins-Young, 2013, p. 27). That is why despite 25 years of independence, these republics still face this problem. The present problem on the Amu Darya is basically revolving around the construction of the Rogun Dam and the issue of hydropower energy.

Hydropower generates approximately 28 % of all electricity in Central Asia (Jalilov, 2010, p. 33).[94] While most of the electricity is produced by Tajikistan, this country only uses less than 4 % of its 527 billion kWh potential (Muzalevsky, 2010). Tajikistan produces around 90 % of its electricity from hydropower plants but since the main consumer of the electricity is aluminum factory (TALCO), the Tajik people are exposed to lack of electricity especially during winters (Petrov, 2010, p. 65). As

[93] Approximately 90 % of the water used in irrigation is consumed by cotton (International Crisis Group, 2014). Moreover, cotton uses approximately 10,000 m^3 of water per hectare (Peachey, 2004).

[94] Potentially, hydropower can provide more than 70 % of its energy (Frenken, 2013, p. 217).

mentioned earlier, to increase its energy output and get rid of the energy deficit, the Tajik government decided to recommence the construction of the Rogun Dam in 2004.

The Rogun Dam project was proposed in 1959 but its plan dates back to 1930s.[95] As stated above, the Soviet Union established the Central Asian Experimental Research Institute for Water Management in 1924 to make the Union one of the largest hydropower producers in the world. At that time Soviet scientists discovered the potential of Tajikistan in this sense and they claimed that the total amount of power of the rivers in Tajikistan was almost 22 billion kWh (Ikrami, 2012). This discovery, in a sense, made Tajikistan the domain of hydropower plants in the union.

The project gained formal endorsement in 1974 after many years of feasibility studies conducted by Soviet engineers (Akhmetkaliyeva, 2016). Although the construction of the dam was launched in 1980s on the Vakhsh River, the collapse of the Soviet Union and then the civil war in Tajikistan halted the project (Central Eurasia Standard, 2013, p. 8).[96] In 2004, President Emomali Rahmon resurrected the project and signed an agreement over construction rights with Russia, but the parties could not agree over the final height, ownership rights, and material that should be used, so the contract was cancelled in 2007 (Kleingeld, 2016, p. 28). Nevertheless, in 2008 President Rahmon announced that the construction of the Rogun Dam would be resumed (Jenkins-Young, 2013).[97]

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[95] In 1953, Nikita Khrushchev launched the 'Virgin Lands' campaign which aimed to expand the agriculture in the region. In order to achieve the goal, the Soviet government decided to construct some plants such as the Rogun Dam and the Kambarata Dams both to regulate the water flow and to generate electricity.

[96] There are 8 more dams on the Vakhsh River, which are the Shurob, the Nurek, the Baipaza, the Sangtuda 1, the Sangtuda 2, the Golovnaya, the Prepadnaya, and the Central. But all of them, except the Nurek Dam, are small dams and do not represent a real threat for downstream water allocation (Jalilov, 2010, p. 23). Moreover, although about 70 % of the construction had been completed by 1991, in 1993 the existing coffer dam was washed away and the tunnels constructed in the 1980s were damaged (World Bank, 2014).

[97] There were reports of higher incidents of tree cutting, putting some communities at greater risk of landslides and mudslides in late 2008 and 2009 when Tajikistan experienced severe electricity shortage as a result of the disagreement between Uzbekistan and Tajikistan (Gullette and de la Croix, 2014, pp. 436-437).

Rahmon declared that the dam would not only solve the electricity problem of Tajikistan, but it also would help the economic development of the country by creating an opportunity of exporting over-produced electricity.[98] In 2013 Tajikistan generated 17 billion kWh electricity and exported 1 billion kWh of it (Daly, 2015). If Tajikistan is able to build the Rogun Dam, it will be able to have 13 billion kWh more electricity so the income of exporting electricity will be higher and economy will grow significantly. Furthermore, the dam will serve to irrigate almost 300,000 ha of arid land not only in Tajikistan but also in other downstream countries on the Amu Darya (Ikrami, 2012). In other words, the project will not only help Tajikistan to solve its electricity problem but also increase the agricultural area in the region. Besides, as Akil Akilov, Prime Minister of Tajikistan between 1999 and 2013 expressed: "The future of the country's economy depends on construction of the Rogun HPP and that it is the answer to the country's social problems. … Many Tajiks also believe that the Rogun HPP will solve all their problems." Moreover, according to some scholars, the Rogun Dam will reduce sedimentation on the Nurek Dam (Ito, El Khatib, and Nakayama, 2016, p. 698).

Even if Tajikistan has its own justifiable reasons to complete the Rogun Dam, these reasons create significant problems for Uzbekistan. According to the Uzbek government, the Rogun Dam will firmly control the Amu Darya with its 3,600 MW power[99] so Tajikistan should not take unilateral steps and has to consult international

[98] What Emomali Rahmon mentioned was the CASA-1000 project (Central Asia-South Asia Electricity Transmission and Trade Project) that is designed to transmit 1,300 MW of electricity from Kyrgyz Republic and Tajikistan to Afghanistan and Pakistan (Ashraf, 2016). The inter-governmental agreement was signed in August 2008 to govern and resolve issues critical to the implementation of the project. The project is expected to be operative by the end of 2018. This project is supported by many international actors including the US because with the project the stabilization of Afghanistan will be contributed through electricity export (Izquierdo, Stangerhaugen, Castillo, Nixon, and Jimenez, 2010). For example, the three well-known companies Switzerland-based ABB, Siemens of Germany, and Alstom of France have applied to establish the converter stations that transmit the electricity to Afghanistan and Pakistan (Bhutta, 2016). Not only Tajikistan will sell its electricity to Afghanistan and Pakistan, but also Kyrgyzstan is the exporter. Uzbekistan discuss that the CASA-1000 Project will aggravate the water management situation in the region because the project is integral with the plans the Rogun Dam and the Kambarata Dam-1 (International Crisis Group, 2014).

[99] The Project is made up of 6 tribunes, each of which has power of 600 MW.

experts for feasibility of the construction. For that reason, Shavkat Mirziyoyev, Prime Minister of Uzbekistan, wrote a letter in 2010 to the Tajik Prime Minister Akilov mentioning Uzbek disturbances and concerns on the Rogun Dam and asking his counterpart to consult international experts (Bıyıkoğlu, 2010). In the letter, the Uzbek Prime Minister would use the following statements (Petrov, 2010, p. 55):

> It is our deep conviction that the possible consequences of building such a grandiose facility as the Rogun hydropower plant should be given an objective and qualified evaluation, paying particular attention to: — the damage this project may inflict on the fragile environmental balance in the region due to the consequences of the Aral disaster; — the influence this project may have on the change in the amount of drainage and its regime with respect to the Amu Darya, since the survival of millions of people in this region with its severe continental desert climate depends directly on the availability of drinking and irrigation water, particularly at times of systematically repetitive low water; — the degree this project is protected from man-triggered threats, primarily the threat of major earthquakes, since the Rogun hydropower plant is to be built in a high seismic zone on a tectonic fault where earthquakes of up to 10 points on the Richter scale have repeatedly occurred. It is difficult to imagine the scale of the humanitarian disaster that would be induced, entailing the deaths of hundreds of thousands of people, if the dam broke. … But the government of the Republic of Tajikistan has totally ignored our repeated appeals regarding this issue and is continuing at an accelerated rate to carry out construction of this facility without taking account of the possible consequences and of the proper project and technical support.

After this letter, Philippe Le Houreu, the World Bank's Regional Vice President for Europe and Central Asia, announced that the World Bank agreed with Tajikistan to fulfill the feasibility study about probable ecological and social consequences based on international procedures (Bıyıkoğlu, 2010). Le Houreu also reminded studies of the World Bank on the Rogun Dam that were started in 2007 upon the request of Tajikistan to analyze the possibility of the construction of the Rogun Dam (Jalilov, 2010).[100]

[100] According to this report it is possible to construct the dam at different time periods. While the Rogun Dam is supposed to provide 5.6 TW/h at the first stage, the height should be 225 m, at the second stage the height should be raised to 285 m with 6.78 km^3. Finally, the dam will be 335 m and reservoir volume will be 13.3 km^3 with storage of 10.3 km^3 (World Bank, 2014).

Table 4*: CASA-1000 Project*
Source: http://www.casa-1000.org/MAP.jpg (accessed on January 14, 2017)

As some experts indicate, the reservoir, which will be created with the completion of the Rogun Dam, is likely to occupy 17,100 ha (Jalilov, 2010, p. 35). The discharge of the Vakhsh River at the site of dam is about 20 km^3. The Rogun Dam is assumed to produce over 13 billion kWh of electricity annually (Akhmetkaliyeva, 2016). The Rogun Dam with 335 m of height will be the tallest dam in the world and also will be the strongest in the region. This results in some serious concern for the downstream countries, especially Uzbekistan, who worries that the water release will result in many hectares of land to be lost in the country (Izquierdo, Stangerhaugen, Castillo, Nixon, and Jimenez, 2010).

As stated previously, agriculture in general and cotton in particular play a very important role for the economy of Uzbekistan because almost 20 % of GDP is formed by agriculture and 26 % of Uzbeks work in agricultural sectors. Therefore, any changes

in water supply causes worries due to this high dependence on water (80 %) from outside the country (FAO, 2014).

There are several studies that evaluate and estimate the impact of the Rogun Dam on Uzbekistan. According to one study that was conducted by Jalilov (2010, pp. 30-37), the Rogun Dam is considered to be filled within around 13 years. During this period, the dam will use approximately 2 % of the Amu Darya annual discharge. Although Jalilov claims that 2 % decrease does not notably influence Uzbekistan because the annual discharge of Amu Darya is between 47 km^3 and 108 km^3, another scholar states that the cost will be around $ 20 billion within this period (Juraev, 2012, p. 3).

When the Rogun Dam starts working in full capacity, the average monthly flow of the Amu Darya will be 6.37 km^3/month in summer and 4.13km^3/month in winter. Therefore, the operation of the Rogun Dam in electricity generation mode will cause 18 % decrease in irrigation period and 54 % increase of water in winter. This change in the water flow will certainly affect Uzbekistan and Uzbek economy. However, as some scholars claim, there are different scenarios about the effect of the dam on Uzbekistan (Jalilov, 2010, pp. 49-50).

The worst case scenario is the situation in which Uzbekistan withdraws more than 500,000 ha from agriculture; i.e. 11 % of irrigated land area of the country, result of which will be more than $ 600 million revenue lost, that is equal to 2.2 % of the country's GDP (Central Eurasia Standard, 2013, p. 10). Moreover, at least 300,000 people will be directly affected by the water shortage (Jalilov, 2010, pp. 51-52). This scenario will be in effect if Uzbekistan does not adjust its agricultural policies and water usage or embrace the adaptive scenario, which has 2 options. The first option suggests the transferring of irrigation system to drip irrigation method whereas the second option states that Uzbekistan should price water. At the former, Jalilov estimates that the cost of transferring is almost $ 200 million in year. This cost might be high but when compared with the lost revenue because of presence of the Rogun Dam (more than $ 600 million) this is reasonable. Moreover, some scholars indicate that around $ 300 million in crop production is lost annually due to the wasteful irrigation that is conducted in Uzbekistan because of its irrigation method (Peachey,

2004). In other words, changing the method is rational when compared with both the worst scenario and the annual loss in production. According to Jalilov (2010, pp. 52-53), Uzbekistan has to change its irrigation system, which is called trench irrigation method, one way or another because it is stated that the country wastes 50 % to 90 % of irrigation water because of its system. Moreover, as stated in a report that was conducted by International Crisis Group (2014) farmers in Uzbekistan object the old-fashioned system and accuse the government:

> [Farmers] are told they have to grow cotton, and the way they water the fields of cotton is very old-fashioned. They should use new modern methods to do it, but [the government] does not want to spend money. They could buy cotton-picking machines, but it is cheaper for them to use children and the people's labour for cotton picking. Uzbekistan cries about the lack of water, but it is not true. It is an artificially created problem.

Therefore, if the drip system is applied in Uzbekistan, the country will begin to use 9 km^3 less water because drip irrigation systems save water and fertilizer by allowing water to drip slowly to the roots of plants through a network of pipes, tubing and emitters (EUCAM, 2012).[101]

The second option of the adaptive scenario suggests that 13 years is enough to gradually cancel or diversify some industries such as textile production, food

[101] Also, when compared to other countries that rely solely on irrigated cotton such as Turkey (1,330 kilograms per hectare) and Australia (1,560), Uzbekistan produces cotton at an average of around 700 kilograms per hectare (Granit et al., 2010, p. 23). However, the water waste is not only a problem for Uzbekistan, but also other countries in the region like Turkmenistan. To illustrate, water consumption in Ashgabat with just about 700,000 inhabitants is equivalent to that of the city of Chicago, which has a population of 2.7 million. Besides, Israel which is located in a region even more arid than Central Asia and with a very developed agricultural sector uses only 5 % that of Turkmenistan (EUCAM, 2012). This is a common problem for Central Asia because as a result of poor renovation and less/no maintenance, between 30 % and 50 % of the water is lost. In the Syr Darya Basin, according to one estimation, only 21 % of water is used efficiently and the remaining 79 % is lost (Sharma, Markandya, Ahmad, Iskakov, and Krishnaswamy, 2004, p. 20). Moreover, some projects like Turkmen Lake (Altyn Asyr Lake) might cause conflict as well between downstream countries of Turkmenistan and Uzbekistan because according to some estimates, a period of 15 years is required to fill the lake completely (Trilling, 2016). Since this means that tons of water will be diverted from Uzbekistan, due to the water scarcity issue, the artificial lake might create tensions between these two countries.

processing, machine building, metallurgy, gold mining, petroleum mining, natural gas mining, and chemical production for Uzbekistan (Jalilov, 2010, pp. 53-56). Thus, if Uzbekistan undertakes adaptive management measures and tries to reduce water use in agriculture, the negative economic impact of the Rogun Dam will be much less than under the 'worst case' scenario. For example, during the filling period, Uzbekistan might be able to reduce water use by 15 % by withdrawing 314,000 ha from irrigation, as a result of which the loss will be around $ 380 million (Jalilov, 2010, p. 59). Thus, when compared to the worst scenario, Uzbekistan will gain almost 200,000 ha land and $ 220 million in revenue. Another advantage of applying the adaptive method is that instead of more than 300,000 people, diversification of some industries will affect around 200,000 people (Jalilov, 2010, p. 59).

Even though agriculture is the largest consumer of water in the world (70 %), it is more significant for Uzbekistan because it uses almost 90 % of water for irrigation (Abdullaev, de Fraiture, Giordano, Yakubov, and Rasulov, 2009, p. 47).[102] In addition, when water-intensive crops are cultivated like cotton, agriculture becomes the chief factor that exacerbate the tensions over water (Committee on Foreign Relations, 2011, p. 7). Therefore, the suggestion of some scholars to Uzbekistan is to change its agricultural products from water-intensive cotton to less-water-consuming crops such as wheat, corn and vegetables. Nonetheless, Uzbekistan alleges that it has reduced its cotton production as much as it can and it also emphasizes that cotton is a vital element in Uzbek culture and ought to be preserved (Izquierdo, Stangerhaugen, Castillo, Nixon, and Jimenez, 2010).[103]

Furthermore, the only criticism and concern of Uzbekistan is not about economy.

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[102] Uzbekistan withdraws almost 56 km^3 of water and use 50 km^3 of it for irrigation (Frenken, 2013, p. 192). The pattern of water use by national economy sector (except agriculture) is as follows: household needs (5.5 %); energy (7.7 %); industrial water use (1.5 %); fish farming in-stream (0.8 %); and others (4.5 %) (Djalalov, 2004).

[103] Uzbekistan accounts for almost 10 % of globally traded cotton, down from more than 20 % in the early 1990s (Granit et al., 2010, p. 22). Moreover, the changes led to a decrease in the water use in Uzbekistan from 110 % in 2002 to 100.6 % in 2007 even though Uzbekistan still consumes more of water resources than available (USAID, 2016).

Uzbek President Karimov had also expressed his worries about a potentially disastrous situation that might take place by the seismic activity of the region where the Rogun Dam is supposed to be constructed. In case of such an accident, Karimov warned that more than 700 settlements with a population of 5 million people would be flooded (Akhmetkaliyeva, 2016). A similar concern was emphasized in the letter that was written by the Prime Minister of Uzbekistan at the time Shavkat Mirziyoyev, as follows (Petrov, 2010, p. 55):

> [There is] primarily the threat of major earthquakes, since the Rogun hydropower plant is to be built in a high seismic zone on a tectonic fault where earthquakes of up to 10 points on the Richter scale have repeatedly occurred. It is difficult to imagine the scale of the humanitarian disaster… if the dam broke.

Moreover, the Uzbek side has worries on the salinity of the river which in turn will ruin the quality of groundwater (Kocak, 2015). President Karimov who believed that the Rogun Dam project would cause water shortage in Uzbekistan during the filling period took one step further and called the Rogun Dam a "stupid project".[104] For him, this project could trigger a war in the region (Nurshayeva, 2012):

> Water resources could become a problem in the future that could escalate tensions not only in our region, but on every continent. … I won't name specific countries, but all this could deteriorate to the point where not just serious confrontation but even wars could be the result. These projects were devised in the '70s and '80s, when we were all living in the Soviet Union and suffering from megalomania, but times change. Hydropower structures today should be built on a different basis entirely.

It was not only Islam Karimov made who stated the possibility of war; the Minister of Finance of Uzbekistan Rustam Azimov (2014) also warned Tajikistan as follows: "Taking into account the extreme water scarcity in Central Asia, this mechanism can be converted into explicit tool of political pressure on downstream countries, provoking escalation of confrontation and growth of conflict potential in the region."

[104] http://www.rferl.org/a/Dont_Love_Your_Neighbor/2185027.html (accessed on December 1, 2016).

On April 1, 2012, Uzbekistan cut the gas transfer to Tajikistan (Kleingeld, 2016, p. 32). While the Uzbek government announced that the halt of the gas supply to Tajikistan was because the contract between the countries was expired, the Tajik Embassy in Moscow evaluated the attempt as follows (Kleingeld, 2016, p. 33):

> Over the last couple of years, Uzbekistan tried to prevent the development of this important sector of Tajikistan's economy by using far-fetched and unfounded pretexts. With that, Uzbekistan is in violation [of] international law. … The ultimate purpose of these steps of Uzbekistan is an attempt to mislead the international community and prevent the completion of the construction of this object.

Just a few weeks after the 'cutting the gas' issue, Uzbekistan placed its tanks and armored personnel carriers at the Tajik-Uzbek border in order to show its attitude against the Rogun Dam (Juraev, 2012, p. 4). In addition to these two issues demonstrating the tension between Uzbekistan and Tajikistan over the Rogun Dam, Uzbekistan stopped the transit of goods through Tajikistan and dismantled the railway that connects the two countries in March 2012.[105] Besides, Uzbekistan closed the border between 2010-2011 in order to prevent the shipment of goods that were used for the construction of the Rogun Dam (Kuchins, Mankoff, Kourmanova, and Backes, 2015, p. 17).

In addition to the attempts of Uzbekistan to prevent the construction of the Rogun Dam, President of Uzbekistan from time to time had commented on the situation that could emerge when the dam would be completed at local level. In such incidence he had argued: "[Tajikistan's planned Rogun dam is] going for the Guinness world record, it would seem, but we are talking here about the lives of millions of people who cannot live without water." (International Crisis Group, 2014).

Some scholars assert that the gigantic Rogun facility has been used as a political tool, so problems regarding technicalities, objections, and other issues are nothing but attempts to legitimize the positions of the countries as can be seen above. However,

[105] https://therearenosunglasses.wordpress.com/2012/04/13/tajik-citizens-report-uzbek-tanks-and-military-vehicles-lining-up-along-border/ (accessed on November 25, 2016).

the politicization of the issue is not only particular to Uzbekistan, the Tajik side also politicizes the Rogun Dam. For President Rahmon: "Rogun is a life or death project for us."[106] Morover, he states that: "[Karimov] fights against all Tajiks… he doesn't want our country to develop, closes roads, shuts off our electricity in the cold of winter." (Central Eurasia Standard, 2013, pp. 11-12). Furthermore, according to some scholars the President of Tajikistan defined the Rogun Dam as 'national idea' and a 'battlefield' for 'national pride and honor' (Hasanova, 2016). For Tajikistan the Rogun Dam project is a fundamental achievement in the development path of the country (Menga and Mirumachi, 2016, pp. 378-379). Therefore, the project becomes a source of legitimacy for the Tajik leadership.[107]

Therefore, the issues and the slogans about the Rogun Dam were the reflection of the leverage power for both countries (Juraev, 2012, p. 3). In other words, while the Tajik side defines water as a leverage against Uzbekistan, which controls nearly all transportation and energy grids that connect to Tajikistan, Uzbekistan uses gas as a leverage because of its concerns over the hydropower station (Gleick and Heberger, 2013). In this sense, some scholars claim that the opposition of Uzbekistan is not only

[106] http://tajikembassy.at/_ld/1/152_S-Stivenson-Pre.pdf (accessed on November 25, 2016).

[107] Defining the problem at local level might create many dangerous consequences in the region because of the position of the Ferhgana Valley. All issues trace back to the delimitation process of Soviet Union. This process left Ferghana Valley as the most volatile area in terms of ethnic diversity and conflict. Ferghana Valley was delimited between Uzbekistan, Tajikistan, and Kyrgyzstan in such a way that each country has different groups in their own territories, such as Uzbeks in Tajikistan and Kyrgyz in Uzbekistan (Batken, Jalalabad and Osh provinces [Kyrgyzstan], Soghd province [Tajikistan], and Ferghana, Namangan and Andijan provinces [Uzbekistan]). Besides, disputed border is around 1,000 km between Uzbekistan, Tajikistan, and Tajikistan, on which 75 security incidents happened in 2012-2013 that left some deaths (International Crisis Group, 2014). Moreover, according to some experts, competing demands on water has a potential to trigger conflict in Ferghana Valley in near future (International Crisis Group, 2014). The situation in the Ferghana Valley is so fragile that some studies the probability of interstate tensions over the dams is 3.5, while the probability of tension in the Valley is 4 (the scale is between 1 and 4. In other words, if the probability is 1, that means the topic least likely causes conflict between parties; but if it is 4, the event most likely results in conflict). Therefore, the leaders of the countries have to be careful when they express their ideas on the projects and keep away from such discourses affecting local people. https://library.ecc-platform.org/conflicts/dam-conflict-between-kyrgyzstan-and-uzbekistan (accessed on November 28, 2016); https://library.ecc-platform.org/conflicts/rogun-dam-tajikistan (accessed on November 28, 2016).

the fear of changes regarding the periods in which water will be allocated. Uzbekistan is also concerned that constructing the dam might give extra power to Tajikistan. This concern was stated by the Minister of Agriculture and Water Resources of Uzbekistan Shovkat Khamraev in an interview as follows: "Tajikistan wants to control the rivers and dictate some unusual conditions" (Kleingeld, 2016, p. 37). Moreover, according to some other scholars, Uzbekistan has one more concern on the project that is to lose its power over Tajikistan. Once the project is completed, Tajikistan will not depend on Uzbekistan and the Uzbek gas to meet its demand so Uzbekistan fears to lose its regional hegemonic position that has been established since independence (Bohr, 2004, p. 494).

Table 5: *Situation in the Ferghana Valley*
Source: https://library.ecc-platform.org/conflicts/livelihood-conflicts-ferghana-valley (accessed on December 22, 2016)

In addition, while the concerns and the statements of Uzbekistan mentioned above were before the publication the report of the World Bank, Uzbekistan has continued to express its concerns on the Rogun Dam (Rozanov, 2015). In this report, it had been asserted that designing the dam in three ways was possible and all of these ways were

more likely to meet the energy demands of Tajikistan than any other alternative options that had been proposed by Uzbekistan (World Bank, 2014). Uzbekistan, however, does not agree with the results of the World Bank and the Minister of Finance of the Republic of Uzbekistan Rustam Azimov criticized the report as follows (2014):

> It was reasoned by our sincere belief that organization of those studies, selection of consultants, financing arrangements, defining the terms of reference and other key aspects which are crucial for the final results of the studies, do not meet internationally recognized standards of independent, impartial, objective and transparent project appraisal.

According to some scholars, another reason why Uzbekistan opposes to the Rogun Dam is that with this project, Tajikistan will be able to export over-produced electricity to Afghanistan. Such an export-agreement, however, will cut the energy export of Uzbekistan to the same country. Therefore, Uzbekistan is afraid of losing one of its trade partners (Tursun, 2013).

On July 22, 2015, Tajikistan announced that Uzbekistan had not opposed to the construction of the Rogun Dam. This statement, however, was denied by Uzbekistan on August 3, 2015 by claiming that Uzbekistan still defends its position over the Rogun Dam that was put forward at the meeting of the representatives of Central Asian countries' governments held in 2014.[108]

To sum up, it seems as if Uzbekistan never, and under no circumstances, will support this project because, the project was designed during the Soviet 'gigantomania' era and ignores the interests of people and states which share the Amu Darya (Putz, 2015). Nevertheless, it does not mean that there is no other option for Uzbekistan or Uzbekistan is willing to exacerbate the conflict. If Tajikistan replaces the project with a smaller one, Uzbekistan is ready to support such a project both ideally and financially (Kleingeld, 2016, p. 36). This idea of building a smaller dam is also supported by some scholars who express their ideas about the efficiency of the power plants in Tajikistan. They claim that if Tajikistan modernizes its 30-year old facilities, then it may be enough to construct a smaller plant because it is estimated that almost 74 % of power

[108] http://www.mfa.uz/en/press/release/2015/08/4992/ (accessed on November 26, 2016).

generation assets in Tajikistan are 30 years old and this causes energy losses around 30 % (Aminjonov, 2016).[109] For this, however, Tajikistan needs financial aid because as claimed by some scholars, the economy of Tajikistan does not allow modernization of these plants on its own (Ito, El Khatib, and Nakayama, 2016).

Recently, Tajikistan has reached an agreement with an Italian firm, Salini Impregilo, to finance the planned construction (Michel, 2016). According to the agreement, although the project, which cost almost $4 billion, will be completed in 13 years, the first two tribunes will be in service by 2018. Besides, according to Western, especially American, point of view the Rogun Dam should be supported by international actors and regional countries because the project will boost the economy of Tajikistan that might reduce the radicalization in the country and then in the region by the aforementioned CASA-1000 project (Zillo, 2013).[110]

A few years ago, many scholars thought that the construction of the Rogun Dam was not possible due to some reasons such as lack of liability of the project and its cost for Tajikistan. As Stucki and Sojamo (2012, p. 409) stated: "Tajikistan … has been struggling to attract funding for increasing its power generation capacity, which is vital for the development of its poor economy; external investors have been reluctant to put off downstream Uzbekistan." Besides, in December 2009, financing the project was so impossible that the Tajik government launched a compulsory campaign for its citizens to purchase almost $ 700 worth of the stocks (Daly, 2015). Likewise as Ito et. al (2016) claimed: "Once the civil war ended, the government of Tajikistan revived the plan. However, Tajikistan's poor economy cannot finance the dam given the high cost of construction (around US$3.5 billion)." But now, Tajikistan completes both of

[109] The modernization process is also important to reduce water use because of the old-generation infrastructures as stated in the report of United Nations WWAP (World Water Assessment Programme) (2016, p. 81).

[110] As will be elaborated in the next chapter, the same objection is also valid for the Kambarata Dam-1 in Kyrgyzstan. Not only economic loss that make Uzbekistan concern over the projects, but also Uzbekistan does not want to lose its leverage over Afghanistan according to some experts (Ito, El Khatib, and Nakayama, 2016, p. 701). This competition will also decrease the energy prices that will affect the volume of energy export by Uzbekistan, meaning reducing in economy.

the requirements of international consultation proposed by the World Bank and financial help from Salini Impregilo. To put in different words, there is not any obstacle for Tajikistan to build the dam, except Uzbekistan.

3.4. Solutions to the Conflict

Certain suggestions and recommendations were made by international organizations and other countries which also experienced problems similar to the ones between Uzbekistan and Tajikistan. For example, it has been suggested that parties to the conflict should be open to discussion and be ready to take into account the objections and concerns of the other side. Furthermore, they need to be engaged in a cooperative behavior in order to maximize benefits and find a permanent solution. In other words, as pointed out by Maksud Bekchanov and his colleagues (2015, p. 856):

> Cooperative basin-wide maximization of benefits would lead to large increases in upstream hydropower production [93 %] and only minor changes in downstream irrigation benefits [-1 %]. However, if upstream stations, including Rogun, are managed unilaterally to maximize energy production, hydropower benefits might more than double [116 %] while irrigation benefits greatly decrease [31 %], thereby substantially reducing overall basin benefits [-18 %].[111]

[111] By numbers (Bekchanov, Ringler, Bhadur, and Jeuland, 2015, pp. 869-870): "The river basin modelling … suggests that cooperative optimal basin-wide management would significantly increase hydropower production (by 93 %) and result in relatively minor adverse impacts downstream in the basin (−1 %). However, the effects of the dam on downstream benefits depend on the pattern of upstream reservoir water releases, and large losses (−31 %) in the agricultural sector would occur if upstream hydropower production benefits were unilaterally maximized. In addition, unilateral operations would only marginally improve energy production benefits and that overall system benefits would be reduced by 18 %."

Table 6*: (Non)Cooperation on the Rogun Dam* (Bekchanov, Ringler, Bhadur, and Jeuland, 2015, p. 869)

	Benefits (USD millions)			Change relative to COOP/− (%)		
Trade-off scenarios	Irrigation	Hydropower	Total	Irrigation	Hydropower	Total
COOP/−	1759	174	1933	0	0	0
COOP/+	1744	336	2080	**−1**	**93**	**8**
DWSMX/−	1774	151	1926	1	−13	0
DWSMX/+	1787	283	2070	2	63	7
UPSMX/−	1559	204	1762	−11	17	−9
UPSMX/+	1206	376	1582	**−31**	**116**	**−18**

Note. −: without Rogun; +: with Rogun; COOP: full cooperation; UPSMX: unilateral maximization of upstream hydropower production benefits; DWSMX: unilateral maximization of irrigation benefits.

As seen in Table 6, if there is cooperation among the relevant parties (COOP/+) while hydropower production increases more than 90 %, the decrease in irrigation will be only 1 % so the total gain will be 8 %. However, if the countries will not cooperate with each other, the region will be in loss. For example, if the upstream countries try to maximize their own benefits unilaterally (UPSMX/+), the irrigation loss will be 31 % despite the increase in hydropower production by 116 %, which will result in 18 % loss in total revenue. On the other hand, if the downstream countries maximize their own benefits without cooperation, the irrigation will only increase 2 %. In other words, while the total gain will be 7 % by DWSMX/+, still it is not higher than 8 % which will only be possible with cooperation. Thus, in one way or another, Central Asian countries in general, Tajikistan and Uzbekistan in particular are supposed to cooperate in order to gain together regarding the Rogun Dam.

In addition to cooperative behavior suggested above, there are other steps that Tajikistan and Uzbekistan can take in order to find a working solution. In this framework, one very important thing Tajikistan and Uzbekistan might do for such a solution is that they can draft a durable legal framework by which both can make concessions from their own individual interests (Erol, 2004, pp. 109-110). As such, water and energy issues should be handled together because while Uzbekistan needs water for irrigation, Tajikistan wants to use water for generating energy (Yıldız,

Çakmak, Yıldırım, and Ekinci, 2014, p. 12). In other words, it is important to apply a holistic approach to solve the problem efficiently (Makhmudov, Makhmudov, and Sherfedinov, 2008, p. 27). As Aaron Wolf (2006) claims, it is not possible to manage the water issue for a single purpose because all water management policies are multi-objective and rely on competing interests.[112]

In addition to the holistic approach, the legal framework should also take into consideration how water is managed by Uzbekistan and Tajikistan. There are two methods of management, which are based on the principles of utilization-manner and sharing-method. While the former asserts that water should be used by countries on equitable, reasonable, and rational manners that prevent them to harm the interests of each other; the latter specifies the sectors in which the water is used as well as the amount needed (Waslekar and Futehally, 2013, pp. 66-70). Furthermore, the framework has to specify a dispute resolution mechanism that is resorted by related countries to solve the probable problems in a peaceful way as seen in some disputes solved by the International Court of Justice (the Senegal River, the Danube River, and the Rhine River), by the Organization of American States (the Amazon River and the La Plata River), and by the Council of Joint Committee (the Mekong River) (Waslekar and Futehally, 2013, pp. 94-97). Therefore, the framework have to consider the long-term goals as well as economic and social results of the management (Dukhovny, Mirzaev, and Sokolov, 2008, p. 20).

According to an OECD report that intends to contribute to tangible and outcome-oriented public policies, there are three dimensions of water governance: effectiveness, efficiency, and trust and engagement (OECD, 2015, p. 3). As shown in the graph below there are 12 principles for water governance. Thus, the legal framework that is supposed to be established need to consider these principles, as well.

[112] No interest subordinates other.

Table 7*: OECD Principles on Water Governance* (OECD, 2015, p. 4)

To sum up, various solutions for the Rogun Dam problem between Tajikistan and Uzbekistan have been proposed, however, the critical question is that to what extend the leaders of Uzbekistan and Tajikistan want a real solution. Uzbekistan in 2007 signed 'the 1997 UN Convention on the Law of the Non-Navigational Uses of International Watercourses (UNWC)' which provides harmonization of regulations, methodologies and procedures, improvement of cross-sectoral cooperation, and increased mutual trust among the parties but for comprehensive solution Tajikistan has to become party to the convention as well (OSCE, 2015, pp. 18-19). According to the Convention, cooperation can only be meaningful if it depends on sovereign equality, territorial integrity, mutual benefit and good faith for optimal utilization and adequate protection of an international watercourse (Boute, 2016, p. 410). According to some scholars, the water problem between these countries is a political issue (Central Eurasia Standard, 2013, p. 19): "These legal agreements are still there, but those countries haven't been following these agreements since the early 2000s. It's difficult

for us to use those approaches if they're not being followed. Everyone realizes it's a political issue." Therefore, the first and the foremost thing has to be dealt with is the 'will' of the leaders for a real solution. Then, leaders gather and solve the problem much easier than can be done in any other (the most democratic) countries. The importance of political will is also emphasized by the presenters of a sympozium that was held in Tajikistan between August 9-11, 2016. They come to a conclusion that strong political will is the most important factor for changing the current behaviors over the water usage in the region and the political will can ultimately cope with the problem by enhancing efficiency and sustainability of water use (Lynch, 2016). In other words, if the leaders agree on cooperation, electricity might be cheaper and water might be managed better. However, for this scenario the leaders should leave their attitudes that define the project as political tool.

Finally, some scholars allege that solution of the water management problem lies in the democratization of the regional countries because in democracies no individual interest subordinates national interests (International Crisis Group, 2014). In other words, they claim that if the region has real institutions and habits of democracy, then water and energy issues can be solved collaboratively. To put it in a different way, if water management is a process to be solved with plurality of actors, institutions, and objectives, democratization is asserted as pre-requirement (Abdullaev and Atabaeva, 2012, p. 111). Furthermore, the democratization process might provide civil society to take part in the discussion for regional cooperation because extreme and unique local situations are better handled by local knowledge and experiences (Global Water Partnership, 2014, p. 16). In other words, decentralized approaches seem more achievable than centralized ones (OSCE, 2015, pp. 24-25). Such participations were fulfilled in some areas like the Mekong River Basin, the Nile River, and the Senegal River where people solved their water management problems (Mosello, 2008, pp. 164-165).

As stated in this chapter, while Tajikistan as an upstream country tries to maximize its hydropower potential by building the huge Rogun Dam on the Vakhsh River, Uzbekistan expresses its concerns over the project and warns its upstream neighbor

about a possible war. The Rogun Dam, therefore, might create tensions between Uzbekistan and Tajikistan. However, since such strained relations may have negative consequences like war, in this chapter some suggestions for reasonable solution were also given. Recently, however, Sulton Rakhimzoda (Deputy Minister of Energy and Water Resources of Tajikistan) and Abdulaziz Kamilov (Foreign Minister of Uzbekistan) on November 16, 2016, discussed the water issue, the Rogun Dam specifically.[113] In other words, both countries decided to take a concrete step to solve the problem.

In the next chapter, the Kambarata Dam-1 and the problems that this dam created for Kyrgyzstan, Kazakhstan, and Uzbekistan are analyzed.

[113] http://avim.org.tr/en/Bulten/TAJIKISTAN-UZBEKISTAN-DISCUSS-WATER-ISSUES (accessed on November 29, 2016)

CHAPTER 4

KAMBARATA DAM-1

Similar to the Rogun Dam mentioned in the last chapter, the Kambarata Dam-1 was not completed during the Soviet era and tensions on this dam have emerged between the upstream Kyrgyzstan and downstream Kazakhstan and Uzbekistan since the collapse of the Soviet Union. In this chapter these tensions between these three countries are analyzed and the following questions are answered: How does the Kambarata Dam-1 on the Syr Darya River affect the relations between Kyrgyzstan on the one side and Uzbekistan and Kazakhstan on the other? Moreover, this chapter will analyze the history of the Kambarata Dam-1 project, the physical capacity of the dam, the reasons why Kyrgyzstan wanted to restart the project after several years, and to what extend will Uzbekistan and Kazakhstan be affected from the dam?

As is done in the previous chapter, however, before examining these issues, we try to understand the reasons why water is important for the parties involved. In other words, the economic activities of the countries and their water-related concerns also need to be given. However, since Uzbekistan was presented in the previous chapter, in this chapter only Kazakhstan and Kyrgyzstan will be analyzed in terms of their economic and water-related activities. However, in the remaining parts of this chapter, Uzbekistan will be regarded as the other party of the conflict on the Kambarata Dam-1.

4.1. Kyrgyzstan

Kyrgyzstan with an area of almost 200,000 km^2 shares borders with Kazakhstan, Uzbekistan, Tajikistan, and China and embraces around 6 million of people (CIA, 2016a). Natural resources are limited in Kyrgyzstan but the mountainous water-rich

country stores water in its glaciers.[114] To illustrate, Kyrgyzstan controls almost 75 % of natural flow of the Syr Darya (Yıldız, Çakmak, Yıldırım, and Ekinci, 2014, p. 16).[115] The huge water resources give Kyrgyzstan the opportunity to produce its own electricity from hydropower plants that were constructed during the Soviet era. Kyrgyzstan produces almost 80 % of its electricity from these plants (CIA, 2016a).[116] However, the produced electricity does not meet the demand. Especially in winter due to the water allocation agreement among the Central Asian countries, Kyrgyzstan experienced energy deficit several times because the downstream countries could not supply required energy (Yıldız, 2014). Eventually, Kyrgyzstan decided to take certain steps in order to decline its energy dependency on downstream countries. Firstly, Kyrgyzstan changed the water allocation scheme of the Toktogul Dam in 1997 and then in 2001, when the Kyrgyz government passed a law that asserted water as national property. Then, Kyrgyzstan started to build dams to produce electricity, one of which is Kambarata Dam-1, which recently has created tensions between the upstream Kyrgyzstan and the downstream Kazakhstan and Uzbekistan. In other words, the initiatives of Kyrgyzstan have been opposed by downstream countries that are heavily depended on the water from Syr Darya for irrigation. Although there have been no conflicts over water among the countries on the Syr Darya Basin since 1991 (except the densely populated and 'artificially' delimited Ferghana Valley as explained in the previous chapter) the emergence of such conflicts is always a possibility (Carius, Feil, and Tänzler, 2003, p. 25).

[114] It is the only country in the region with no-dependency rate on water (FAO, 2014).

[115] Other than Syr Darya, there are 5 more river basins in Kyrgyzstan. They are 1) Chu, Talas and Assa river basins, 2) Southeastern river basins, 3) Lake Issyk-Kul internal and interior basin, 4) Amu Darya river basin, 5) Lake Balkhash basin (Frenken, 2013, p. 132).

[116] The hydroelectric potential of Kyrgyzstan is estimated to be over 140 billion kWh per year, less than 10 % of which is currently utilized (Rakhmanova, 2015, p. 61). In other words, Kyrgyzstan is ready to utilize its potential. As claimed by President Almazbek Atambayev, water is the main wealth and weapon that they can use (Wooden, 2014, p. 476).

4.2. Kazakhstan

Located in the north of Central Asia Kazakhstan is the largest country with more than 2.7 million km^2 of territory (Carius, Feil, and Tänzler, 2003, p. 7). It shares borders with Kyrgyzstan, Turkmenistan, Uzbekistan, the Russian Federation and China. This largest country in Central Asia has almost 19 million people (CIA, 2016b).

Kazakhstan is endowed with huge energy resources, for example 78 % of region's hydrocarbon fuel in Kazakhstan (oil, natural gas, and coal) (Sharma, Markandya, Ahmad, Iskakov, and Krishnaswamy, 2004, p. 4). There are more than 200 hydrocarbon fields (Dulambayeva, Boluspayev, Daribayeva, and Nurmaganbetova, 2013, p. 969). Furthermore, Kazakhstan produces almost 90 million tons of coal[117] and it exports almost 40 % of its coal production.[118] The production of oil also is around 80 million tons and only 17 % of it is consumed for domestic needs (Kasymova and Baetov, 2010, p. 33).[119] Although natural gas is available in Kazakhstan, it is relatively less in amount (only 18 million tons but half of it is exported) (Kasymova and Baetov, 2010, pp. 33-34).

Despite the fact that the Kazakh economy mainly depends on natural resources, agriculture is also important for Kazakhstan. Although only 5 % of Kazakhstan's GDP comes from agriculture, almost 25 % of the population works in this sector (CIA, 2016b).[120] That is to say, the importance of agriculture for Kazakhstan is not

[117] Almost 85 % of all coal production in Central Asia is realized in Kazakhstan (Sharma, Markandya, Ahmad, Iskakov, and Krishnaswamy, 2004, p. 4).

[118] One source states that Kazakhstan consumes most of its production and only 26 % of coal is exported (Kasymova and Baetov, 2010, p. 32). Another source indicates that coal production in Kazakhstan is 1.9 times greater than its consumption (Dulambayeva, Boluspayev, Daribayeva, and Nurmaganbetova, 2013, p. 969).

[119] Kazakhstan was the 15th largest oil producer in 2014 and if it can achieve its goal to increase the production to 130 million tons per year by 2020, it will be in the top 10 list (Hoogendoorn, 2016).

[120] According to one source, the share of agriculture in GDP was around 10 % in early 2000s and around 23 % of population worked in the sector (McKinney, 2003, p. 14). What needs to be considered is that although the share of agriculture has been reducing over years, the

necessarily related to the contribution of this sector to the GDP but related to the role it plays in terms of providing jobs to the people.[121] In addition, more than 80 % of the total area of the country is classified as agricultural land in which fodder, cereals, cotton, fruits, potatoes, rice, and sugar beets are cropped (Syzdykov, Aitmambet, and Dautov, 2015, p. 3).[122] However, water resources of Kazakhstan is not enough for its agriculture and the country depends on water from outside; i.e., Kyrgyzstan (40 %) (FAO, 2014). Therefore, Kazakhstan has stated its objections to any unilateral attempt of Kyrgyzstan in terms of water management issues and has always claimed that common positions and mutual interests can provide regional stability; therefore regional water strategies for all Central Asian countries should be developed (McKinney, 2003, p. 15). As such, the Syr Darya constitutes a vital source of water for Kazakhstan and has led to disputes over water allocation between this country and Kyrgyzstan. If the existing problems are not solved, the tension might affect stability in the region.

4.3. Kambarata Dam-1

The Kambarata Dam-1, just like the Rogun Dam, was initiated by the Soviet government as part of the plan to become the largest hydropower energy producer in the world, but the project could not be completed due to the collapse of the Soviet Union.[123] In this part, first some information on the Syr Darya River where the dam will be constructed, then the history of the Kambarata Dam-1 will be given.

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dependency of people on agriculture has increased. Therefore, we can say that agriculture in Kazakhstan is an important factor in the future of its people.

[121] It should be noted that in Central Asia Kazakhstan is the country in which water is used the least for irrigation (66 %) (Frenken, 2013, p. 41).

[122] Kazakhstan is already among the world's top-eight grain producing countries, production of wheat in 2008 reaching 15 million tonnes, and it is the number-one exporter of flour. Currently 60 % of Kazakhstan's agricultural exports are grains (Granit et al., 2010, p. 22).

[123] Electricity generation in Kyrgyzstan, from hydropower plants rose over 650 % in 1970-1990 (Gullette and de la Croix, 2014, p. 438).

The Syr Darya River originates mainly in Kyrgyzstan, a country that controls around 75 % of the water flow in the river (Kayumov, 2016). Similar to Amu Darya, it is called a transboundary river with its several stations located in Uzbekistan, Tajikistan, and Kazakstan. Along with its 2,212 km, the Syr Darya River occupies almost 345,000 km^2 and constitutes around 30 % of Aral Sea (Frenken, 2013, p. 110). Furthermore, Syr Darya is fed by the Naryn River and Kara Darya (Allahverdiyev, 2015, p. 70). The Naryn River originating in Kyrgyzstan is the main water resource of Syr Darya, with 59,000km^2 catchment area and 13.8 km^3 water, and flows into the Ferghana Valley where it confluences with Kara Darya, which is 177 km long with 12.8 km^3 of water.

Table 8*: Syr Darya* (Wegerich, Rooijen, Soliev, and Mukhamedova, 2015)

Agricultural area in the Syr Darya Basin, which hosts almost 20 million people, is around 3.5 million ha, and more than 50 % of it belong to Uzbekistan (Manat, 2008). While in early 1990s almost 45 % of the irrigated area in the basin was cotton, the area allocated to cotton decreased to about 30 % (Wegerich, Rooijen, Soliev, and

Mukhamedova, 2015). During same period, the area for growing cereals, which was not cultivated in early 1990s, increased to 30 % as shown in Table 7.[124]

Table 9*: Agriculture in the Syr Darya Basin* (Wegerich, Rooijen, Soliev, and Mukhamedova, 2015)

In 1974, the Soviet regime initiated the project of the Toktogul reservoir on the Naryn River,[125] which had the capacity of 1,200 MW to manage the river flow depending on seasons (Bichsel, 2011, p. 24). The reservoir, which was designed both for developing the irrigated lands of the Syr Darya Basin and generating electricity, allowed the

[124] Mainly wheat because it can be produced in winter when the water is supposed to be released.

[125] There are 13 more hydropower plants on the river including Kurpsay HPP (800 MW), Tash-Kumyr HPP (450 MW), Shamaldy-Say HPP (240 MW) and Uch- Kurgan HPP (180 MW) (Kasymova and Baetov, 2010, p. 38).

development of around 400,000 previously unused ha of land and the improvement of the irrigation situation of some 1,000,000 ha of land in Kazakhstan and in Uzbekistan (Valentini, Orolbaev, and Abylgazieva, 2004, p. 68). Moreover, during the same period, irrigated area was expanded by 130 % in the basin (Frenken, 2013, p. 47). The irrigation-prioritized usage of the reservoir was fulfilled with the Protocol No. 413 that was accepted in 1984. According to the Protocol, Uzbekistan was the main consumer of the river with 46 % followed by Kazakhstan with 44 %. While Tajikistan was using 8 % of the water flow, the country of origin, that is Kyrgyzstan, had only the right to utilize 2 % of the river's water flow (Sharma, Markandya, Ahmad, Iskakov, and Krishnaswamy, 2004, p. 8). This protocol prioritized irrigation (focusing mainly on cotton) and stated that almost 75 % of the annual release should have been made in summer, while the remaining 25 % to be in winter (Sievers, 2002, pp. 371-372).

According to this management protocol, Kazakhstan and Uzbekistan supplied energy to Kyrgyzstan in order to meet the winter demand. However, with independence, because of the priorities and national interests, the management of Syr Darya/Toktogul Dam became problematic among the relevant parties. Kyrgyzstan redefined the purpose of the Toktogul Dam not only as an aid to, but also as a means to meet its energy demands for itself in winter (Sievers, 2002, p. 372). Firstly, Kyrgyzstan changed the water flow of the Toktogul reservoir in 1997 and it issued a law asserting water as national property in 2001. This law was strongly criticized by Kazakhstan and Uzbekistan. While the president of the former country, Nursultan Nazarbayev expressed that it is impossible to set a price for irrigation water as it contradicts international standards so the law is unacceptable for Kazakhstan, Uzbek President Islam Karimov told that water belonged to God (Sorg et al., 2014, p. 73).

However, Kyrgyzstan continued to release less water in summer and increased the capacity in winter to produce electricity and to reduce its dependency to the downstream countries (Valentini, Orolbaev, and Abylgazieva, 2004). For example, whereas the summer release fell from 75 % to 45 % during 1991-2000, the release in

winter increased to 55 % (Wegerich, 2011, p. 283).[126] Hereby, Kyrgyzstan has seen a four-fold increase in hydroenergy (Granit et al., 2010, p. 20). Changes in the operation of the Toktogul Reservoir, however, caused some negative consequences in the basin at that time such as insufficient water for irrigation, water loss in the Aral Sea, flooding of populated areas (in winter), and worsening environmental situation (Frenken, 2013, pp. 114-115). Furthermore, the changes in the operation of the reservoir have made the water availability unstable in the Kyzylorda, a region is Kazakhstan (Dukhovny and Horst, 2008, p. 100).

However, in 2008 when the drought reduced the capacity of the Toktogul Dam to a critical point (6.4 km^3 with a design volume of 19 km^3) (Juraev, 2009),[127] the Kyrgyz government realized that even though the country produces 80 % of its electricity from hydropower plants (Aminjonov, 2016) and it has increased the capacity 4-times since independence, the hydropower plants could not meet the demand of the country.[128] In 2008, the Kyrgyz government realized the existence of an energy crisis and imposed severe restrictions on electricity consumption in domestic life; and exports were reduced to 553 million kWh from 2.5 billion kWh in 2007 (Kasymova and Baetov, 2010, p. 36). In the same year, business owners had to resort to purchasing generators to keep businesses open and apartment blocks were lightened by candles. Moreover, people took to the street to voice their demands on the continuing energy crisis and

[126] Another article states that the release in the non-irrigation period (winter) increased from 2.8 km^3 to 8.5 km^3 (Antipova, Zyryanov, McKinney, and Savitsky, 2001, p. 5). This change can be interpreted as an indication that Kyrgyzstan replaced fossil fuels with electricity in order to heat, cook, and for providing hot water.

[127] Some scholars claim that one of the reasons of the 2010 revolution is the energy deficit. Indeed, some scholars describe the revolution as a hydroelectric revolution (Wooden, 2014, pp. 463-464). For example, in a survey conducted in 2009 concluded that 28 % of Kyrgyz people saw the electricity crisis as the most serious problem, the second after the economic concerns with 31 % (Wooden, 2014, p. 468). Also, nearly 90 % of them stated that they had read, heard, or seen news about the energy issues in the country, while only 55 % knew about environmental issues. Eventually, the first thing the new government (interim government) did was to cancel the tariffs imposed by Bakiev (Wooden, 2014, p. 476).

[128] As stated in the situation for Tajikistan, the hydropower potential of Kyrgyzstan is more than how much it produces now. It is over 140 billion kWh but less than 10 % of which is currently utilized (Rakhmanova, 2015, p. 61).

tariffs (Gullette and de la Croix, 2014, p. 436). Eventually, the government acknowledged the necessity of reinitiating of the project Kambarata Dam-1 and started to take steps to that end in 2010.

The reason why the dam is called Kambarata Dam-1 was due to the fact that this was a series of projects that had been started by the Soviet government in 1986 (Yıldız, Çakmak, Yıldırım, and Ekinci, 2014, p. 24). There is another dam project that was also launched by the Soviet government but completed after independence by Kyrgyzstan: Kambarata Dam-2 which is smaller than Kambarata Dam-1, with a total capacity of 360 MW and commissioned in 2010. Although the Kambarata Dam-2 produces almost 500 million KW of electricity, when the Kyrgyz government realized that it could not provide electricity for some parts of the country as long as 12 hours in a day, it decided to start the long-waiting project of Kambarata Dam-1 (Kraak, 2012).

Even before the Kambarata Dam-1 project was reinitiated, Kyrgyzstan already had conflictual relations with the downstream countries of Uzbekistan and Kazakhstan over the use of water in Syr Darya, but as will be elaborated in this chapter the project seems to deteriorate the relations. As Anar Khamzayeva and her colleagues suggest (2009, pp. 20-21):

> Kyrgyzstan's relations with downstream countries on Syr-Darya have been quite conflictive, with unsubstantiated reports claiming that in 1996 Uzbekistan threatened to use military force to seize the Toktogul dam and reservoir, the strategic water infrastructure, in the event of Kyrgyzstan attempting to change the prevailing distribution policy. This appears to be believable as cotton fields in Uzbekistan and Kazakhstan were flooded in the winters of 1993, 1998 and 2001, with Kyrgyzstan releasing too much water from the dams in that period and during the summer season not enough was available for irrigation.

Moreover, in that period the changing operation of the Toktogul Dam had created ecological problems such as the formation of the Aydar Kul Lake near the Uzbek-Kazakh border, and the increasing shrinkage of the Aral Sea (Bunn, 2013, p. 135). The latter issue has been an on-going problem in the region since the 1960s, while the former is relatively new that creates tensions among these countries. The Aydar Kul Lake is part of the Aydar-Arnasay Lake system including 3 lakes (Aydar Kul, Arnasay and Tuzkan). When Kyrgyzstan decided to change the mission of the Toktogul

Reservoir for energy generation, the transition increased water discharges to the Chardara reservoir during winter (Rodina, 2010, pp. 51-53). Thus, the surplus water in the Chardara reservoir was released to the Aydar-Arnasay system and the Aydar Kul Lake became the third largest in the region with 41 km^3 of water. This unexpected expansion of the Aydar Kul Lake, however, increased the mineralization in the lake which in turn affected both fishery and agriculture in downstream countries (Groll, Kulmatov, Mullabaev, Opp, and Kulmatova, 2016).

The Kambarata Dam-1 with 1,900 MW of capacity and around 245 m of height is now the main reason/trigger of conflict between Kyrgyzstan and downstream Kazakhstan and Uzbekistan (Juraev, 2009). The Kambarata Dam-1, when completed, will be the largest dam on the Naryn River in terms of height as well as power generating capacity with almost 5 billion kWh (Kraak, 2012). With the project, Kyrgyzstan will certainly produce more electricity which is believed not only to solve the chronic power problem for domestic demand but also help the economy by exporting the surplus to Afghanistan and Pakistan via CASA-1000 (Kaliev, 2014). Similar to the situation in the Rogun Dam, the downstream countries which had no problem with the Kambarata Dam-2 allege that Kyrgyzstan will control the river with the new dam.

Even though academics, diplomats, and national energy experts question the value and the necessity of the dam, the former President Kurmanbek Bakiyev had expressed that the implementation of the Kambarata Dam-1 project would not only satisfy the energy needs of Kyrgyzstan, but also would allow the Toktogul Dam to operate more properly during irrigation period (Kraak, 2012). Not only President of Kyrgyzstan explains the advantages of Kambarata Dam-1, but some Kyrgyz experts who work in this project claim:[129]

> Water flowing through the plant's turbines will be accumulated in the Toktogul reservoir. Fully-fledged long term regulation of the River Naryn's flow can be provided only through the Toktogul reservoir. So it makes no sense to say that someone will get additional leverages. The Kyrgyz Republic has always stressed that it is open to mutually beneficial cooperation.

[129] http://en.trend.az/casia/kyrgyzstan/2107051.html (accessed on October 26, 2016).

Likewise, the importance of the dam for the downstream countries is also emphasized as follows: "By adjusting Kambarata HPP-1 operation water will be released in a timely manner during the summer to meet irrigation demands from Uzbekistan and Kazakhstan."[130]

This project was also asserted as the most accurate solution to solve the water management problem in the region by Valentini, Orolbaev and Abylgazieva (2004, p. 72):

> The most acceptable though expensive solution for the combination of irrigation and energy interests within the Syr Darya river basin is well known. It requires some 2.5 bln. US$ for the construction of two Kambar Ata power plants above the Toktogul facility along the Naryn river. The installation of the new generating capacities is estimated to fully cover the growing needs of the Kyrgyz Republic, to allow increased exports of electricity and to use the water from the Toktogul reservoir mostly for irrigation purposes, in favor of the downstream states. … With the help of new facilities, the flows of the Syr Darya River will be fully regulated, thus allowing effective management of water resources and significant reduction of costs for the prevention of floods along the main regional water arteries.

Dadabaev (2016, p. 78) also shows another advantage of the dam by the following statement: "The construction of the Kambarata dams undoubtedly represents a positive step towards the resolution of the most acute water supply problems, not only for Kyrgyzstan but also for the remaining CA [Central Asian] states."

Moreover, Valentini and her colleagues (2004, p. 73) claim that there will be one more advantage of the plans in the region:

> By securing the finance for implementing these plans, Central Asia will be provided with cheap power for the whole century ahead and will be able to export power outside of the region. In addition, it will be able to use the remaining coal, oil and gas in a more rational way than burning in power stations, for instance in the chemical industry.

Although the Kyrgyz side and some international experts claim that the Kambarata Dam-1 will be beneficial both for Kyrgyzstan and the downstream Kazakhstan and

[130] http://www.snclavalin.com/en/feasibility-study-for-kambarata-hpp-1 (accessed on October 26, 2016).

Uzbekistan, these downstream countries have some concerns about the project and have taken some steps to prevent the construction of the project since the beginning. In the following part of the chapter, the attempts of these countries against the project are described.

4.3.1. Objections of Uzbekistan

Uzbekistan has stated its objections since the announcement of Kyrgyzstan to restart the frozen-project and it has some serious concerns about this project regardless of the potential benefits. First of all, Uzbekistan claims that downstream countries' approval is necessary for any mega-project like Kambarata Dam-1 (Jenkins-Young, 2013, p. 38) because it seems that the project will make the similar impact on Uzbekistan as Rogun Dam will do (Merkulova, 2013). To illustrate, President Karimov in his speech in 2012 warned Kyrgyzstan about the area where the Kambarata Dam-1 was supposed to be and reminded that there happened three strong earthquakes in the last few centuries (Matveeva, 2012): "If this has happened in the last few centuries, why can't we think that this might happen again tomorrow?" Uzbek officials also accused Kyrgyzstan wanting to sell the water from an international river and evaluated the construction of Kambarata Dam-1 to extend its control over the river flow in order to blackmail the downstream states (Kraak, 2012).[131]

Therefore, Uzbekistan took some steps to prevent the construction of the Kambarata Dam-1 as it did for the Rogun Dam. In 2013 it cut the rail transit and reduced the gas supply (International Crisis Group, 2014). Besides, Uzbekistan cut the gas supply to Kyrgyzstan in April 2014, which led the Kyrgyz people suffer from energy shortage during the winter. As a response, Kyrgyzstan started to discuss repairing the Big Namangan Canal that provides water to Uzbekistan in June (International Crisis Group, 2014). Then, Uzbekistan resumed gas supply to Kyrgyzstan at the end of 2014

[131] Uzbekistan also accuses Tajikistan in a similar way. Some experts state that there is another concern that makes Uzbekistan blame the upstream countries other than controlling the river or agricultural issues: loss of regional hegemony. They claim that Uzbekistan has consolidated its position as the regional hegemon since independence and tried to replace Moscow in the region with its largest population and armed forces (Bohr, 2004, p. 494).

as announced by Tahir Alimov, the deputy director of the Osh branch of Gazprom Kyrgyzstan.[132] Although Uzbekistan reported that the issue was done because the contract with Kyrgyzstan expired in April, many authorities stated that the stoppage of Uzbekistan was an attempt to prevent the construction of the Kambarata Dam-1 (International Crisis Group, 2014).

In 2015, Minister of Foreign Affairs of Uzbekistan Abdulaziz Kamilov reemphasized that Uzbekistan would not allow the construction of the dams (including the Rogun Dam) at the United Nations Sustainable Development Summit by referring the situation of the Aral Sea as follows (2015, p. 4):

> We cannot allow so that, as a result of realization of plans of construction of gigantic dams and large hydropower stations on the tributaries of Amudarya and Syrdarya on the basins of which the oases of life support millions of people are concentrated, the natural flow of these rivers is disturbed and the situation with water supply in the lower reaches is more worsened, which would lead to radical breach of the water and ecological balance, aggravation of the problem of Aral and undermining of ecological safety of the vast region.

More recently, on March 18, 2016, Uzbekistan deployed several armored vehicles and military personnel to the Kyrgyz border (Jalalabad region). Although Uzbekistan stated that the deployment was part of a routine reinforcement for Navruz, the Kyrgyz side insisted that this was the attempt like the previous ones over the water conflict between them (Toktonaliev, 2016). Not only did Kyrgyzstan announce the deployment as a result of water issue, some scholars also supported this argument (Toktonaliev, 2016): "The military deployment could have been done for several reasons … [Kyrgyz] hydro-power projects may be another reason for that."

Nevertheless, some scholars argue that the objections of Uzbekistan are not understandable as the Kambarata Dam-1 provides certain advantages to this country (Manat, 2008):

> Uzbekistan, in turn, opposes any idea of additional HPPs in Kyrgyzstan because of the state's prospective ability to unilaterally manage water services.

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132 http://www.rferl.org/a/uzbekistan-kyrgyzstan-gas-resumption-osh/26768858.html (accessed on November 28, 2016).

> Uzbekistan is right to claim the transnational status of Syr Darya, however, it is in the country's best interests to have Kyrgyzstan build hydro-energy infrastructure that will allow the release of water even during low water periods…. Once finished, they would have the potential of producing more hydro-energy and manage water in the Syr Darya River so it would meet the interests of downstream Uzbekistan as well.

4.3.2. Objections of Kazakhstan

The other riparian state that will be affected by the project is Kazakhstan. Like President of Uzbekistan, Kazakh President Nursultan Nazarbayev is also concerned about the construction of the dam and indicates the situation as follows (Jenkins-Young, 2013, pp. 38-39):

> To our neighbors and brothers who are 'sitting' on the upper reaches of these rivers, we send another 'fraternal signal' that we –Kazakhstan and Uzbekistan on the Amu-Darya and Turkmenistan, located downstream – most of all perceive the shortage of water; each person feels it, because this is their life; this is the life of millions of people.

Moreover, at a meeting with Uzbekistan in March 2010, President Nazarbayev stated that Kazakhstan supported the position of Uzbekistan and he added that in order to build such gigantic facilities (including the Rogun Dam) security guarantees of downstream countries have to be required (Petrov, 2010, p. 55). Even before the construction was started, the Kazakh government was making some announcements to prevent the building of the power station by pointing out that this project would break the 'fragile' balance in the whole region (Khamzayeva et al., 2009, p. 88).

As demonstrated above, the downstream countries (especially Uzbekistan) try to stop the construction of the Kambarata Dam-1 in ways that are used in the Rogun Dam such as cutting gas supply, deploying army, and defining the issue at local level. However, it is not the only downstream countries that politicize the issue; Kyrgyzstan also uses water as leverage over the downstream countries. For example, in 2013 when Uzbekistan cut rail freight traffic and gas supply, a Kyrgyz official stated that if Uzbekistan did not allow trains to go, it would not get any water from Kyrgyzstan (International Crisis Group, 2014).

In addition to the objections of Kazakhstan and Uzbekistan, some independent experts criticize the project as follows (Merkulova, 2013):

> Kambarata-1 project had no other expertise other than old Soviet one. The problem with Soviet expertise is not that it's wrong in terms of engineering or safety of water resources. The real idea of why Kambarata project need reassessment is because the climate in the region was changing since 60-s - it's no longer up to date with the current conditions.[133]

In spite of all these criticisms, President of Kyrgyzstan Almazbek Atambayev reemphasized the necessity of the Kambarata project, suggesting that even if the Uzbek government wants Kyrgyzstan "to beg for natural resources" this will not happen and Kyrgyzstan will take the necessary measures on its own (Yıldız, 2014). Therefore, one way or another, Kyrgyzstan will continue the project and the Kambarata Dam-1 will start its operation in near future. An earlier report on the Kambarata Dam-1 made by the U.S. Agency for International Development (USAID) (2003, p. 1) stated the following:

> The basic problem with the Kyrgyzstan power system is that the hydropower projects …. produce most of their energy in the summer, whereas the peak energy demand is in the winter months. … Consequently, the operators of Toktogul aim to maximize reservoir releases and energy production in the winter and minimize reservoir release to the downstream countries in the summer. … The addition of Kambarata 1 will eliminate the winter deficits and thereby eliminate the conflict in the operation of the Toktogul Reservoir between the irrigation and environmental needs of the downstream countries and the winter energy needs of Kyrgyzstan.

There is one more important issue to be dealt with by Kyrgyzstan. Although some scholars clearly point out that the Kambarata Dam-1 is much more achievable when compared to the Rogun Dam (Rozanov, 2015), criteria of these scholars are only limited to the reactions of downstream countries. In that sense, Rogun Dam alerts

[133] The Kyrgyz government, also, shares the concern and asked a feasibility study for the Kambarata Dam-1. The company which conducted the study states that: "One of the challenges in the Kamarata-1 project was assessing a project plan developed 25 years prior by the Tashkent Hydro Design Institute. Our job was to update the plan, optimize it and provide redesign recommendations that complied with Kyrgyz regulations and Russian technical standards." http://www.snclavalin.com/en/feasibility-study-for-kambarata-hpp-1 (accessed on November 28, 2016).

Uzbekistan more than the Kambarata Dam-1 does because of the leverage power of the former (Kanagatuly, Sikorskaya, Tokbaeva, and Olimova, 2010). However, like Tajikistan, Kyrgyzstan is not developed enough to finance such a huge project on its own, so it needs investors. Nevertheless, these scholars do not mention the financial obstacle of Kyrgyzstan when compared the likelihood of the Rogun Dam with the Kambarata Dam-1. Actually, Russia and Kyrgyzstan made an agreement on the construction of the Kambarata Dam-1 that cost almost $2 billion in 2012,[134] but early in 2016 Kyrgyzstan announced that the agreement with Russia was broken down because of the situation of the Russian economy (Sabatar, 2016). Therefore, even though Uzbekistan is more moderate in terms of the Kambarata Dam-1 than the Rogun Dam, if Kyrgyzstan is not able to find investor(s) the dam will not be in use.[135]

Despite the advantages of Kambarata Dam-1, there is a huge concern that the dam will escalate the economic and political tensions between Kyrgyzstan on the one side and Uzbekistan and Kazakhstan on the other. Therefore, as stated above both parties of the disagreement try to do their best to find the optimum solution either for themselves or for whole regional security. In this respect, international organizations are also supposed to take some steps and act as peacemakers such as an energy club within the Shanghai Cooperation Organization that was voiced at the SCO summit in Bishkek in 2013.

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[134] Indeed, the feasibility studies of the dam were sent to Russia (Hashimova, 2014).

[135] The Kyrgyz government asserted that the project would be continue with or without Russia and there are many investors interesting in project but so far there has not been any concrete step taken to find investors (Sabatar, 2016). In my opinion, even though it remains silent after the breakdown of the agreement, China has the potential power but most importantly rational reasons (such as being the biggest economic actor as has been trying since 1991) to be the new investor. Nevertheless, there is a significant question in that respect: Does Russia allow such an attempt of China that possibly makes it the most reliable player in the region and maybe the winner of the 'Great Game'? Moreover, we should remember the words of General Liu Yazhou of China's People's Liberation Army to evaluate the interest of China on Central Asia (Pannier, 2014): "Central Asia is the thickest piece of cake given to modern China by the heavens." However, China may not be the only country in this equation. As Duyshenbek Zilaliev, Chairman of the State Committee for Industry, Energy and Subsoil Management in Kyrgyzstan, stated that Japan were interested to finance the project (Kostenko, 2016).

4.4. Solutions to the Conflict

As clearly pointed out in this chapter, Kyrgyzstan tries to maximize its electricity production both for meeting its domestic demand and improving its economy via some projects such as CASA-1000, while the downstream countries of Kazakhstan and Uzbekistan criticize it because of its probable consequences. Therefore, the Kambarata Dam-1 might be source of tension between upstream Kyrgyzstan and downstream Kazakhstan and Uzbekistan unless a reasonable solution is found.

For this reason, the countries affected by the project should come together and find such a solution to this problem. In this sense, Kyrgyzstan might arrange interstate cooperation with regional countries and develop integration in energy and water use apart from rolling blackouts, restrictions on electricity consumption, and unilateral mega-projects as addressed by Almazbek Atambayev and it must be to be ready to cooperate with the downstream countries (Tursun, 2013). This is also important for neighboring countries that will have additional benefits if they take part in the construction of the Kambarata Dam-1 by establishing an international monitoring mechanism or at least allowing the existent mechanism to function (Kasymova and Baetov, 2010, p. 51).

Moreover, similar to Tajikistan, 64 % of power generation assets in Kyrgyzstan are over 30 years old and current total loss because of these old assets is almost 40 % (Aminjonov, 2016). As some authors claim (Kasymova and Baetov, 2010, p. 51): "It is also possible to restore 39 previously existing small HPPs with a total capacity of 22 MW and average annual output of up to 100 kWh". In other words, if Kyrgyzstan restores the old-fashioned assets before building the huge dam, or if it constructs smaller dams to meet the domestic demand and to improve economy via CASA-1000 it will not face any confrontation with the downstream countries. As Kasymova and Baetov (2010, p. 51) suggest: "The Kyrgyz Republic has opportunities to build 92 new small hydro plants with a total capacity of 178 MW and average annual output of up to 1.0 billion kWh of electricity." The smaller dams might be enough to solve the problems of Kyrgyzstan (also Tajikistan) as pointed out by an expert (Panfilova, 2014):

> Mega projects of Rogun and Kambarata must be fundamentally rejected and the decision to seek solutions to our current energy problems must come from other areas. … New projects are needed, small and medium hydropower, renewable energy sources that do not cause conflict and that are without prejudice to the region in general solve problems of each of the small republics.

The problem in Kyrgyzstan is not only limited to the power generation assets, but also other infrastructures which do not effectively work. According to an official in the Batken region in Kyrgyzstan: "Water conflicts appear not because we don't have enough water but because it is not effectively regulated. All the canals are old … the canals have to be renovated." Therefore, similar to Uzbekistan and Tajikistan, Kyrgyzstan also uses water ineffectively and as put forward by an official in Kyrgyzstan the country might experience conflict because of losing too much water that causes scarcity (International Crisis Group, 2014).

The other thing might be the restoration of the Bishkek Agreement which was signed in 1998 between Uzbekistan, Kyrgyzstan and Kazakhstan on the use of water and energy resources of the Syr Darya. This agreement was made in order to regulate the water flow of the Toktogul Reservoir but the countries can hold a meeting and make another agreement that includes both the regulation of the Toktogul Reservoir and the Kambarata Dam-1. In this way, all countries can get benefits. The new agreement as claimed in the previous chapter should include the three dimensions of water governance, which are effectiveness, efficiency, and trust and engagement (OECD, 2015, p. 3).

Actually, Kyrgyzstan and Kazakhstan had some experience on water management issue on the Chu-Talas Commission that was founded on July 26, 2006. This commission is defined as the best practice on transboundary water so far in the region (Libert, 2008, p. 39). This agreement, contrary to the others that were mentioned in previous chapters, is valid and still regulates the water allocations of the Chu-Talas River between Kyrgyzstan and Kazakhstan. Furthermore, the agreement was and still is supported by many international organizations such as the United Nations Economic Commission for Europe (UNECE), the Asian Development Bank (ADB), and the United Nations Economic and Social Commission for Asia and the Pacific

(UNESCAP) (Bure, 2008, p. 132). Therefore, when the three countries come together to renew/construct an agreement, the Chu-Talas agreement may serve as an example for a solution.

In addition to the new agreement, if Kyrgyzstan and Kazakhstan join Uzbekistan and be a party to 'the 1997 UN Convention on the Law of the Non-Navigational Uses of International Watercourses (UNWC)', then this convention might recommend new ideas for solution because as stated in the previous chapter the Convention put some principles for sustainable solution (OSCE, 2015, pp. 18-19).

Considering civil society as an important actor in the water discussion, as described in the previous chapter, is not only possible in democratic countries, but also achievable. The most important factor here is that whether the leaders want to solve the problem peacefully. In other words, civil society may contribute to finding a solution, but the leaders in the region have a tendency to politicize this issue whenever and wherever they need to be supported by people.[136] Therefore, as claimed in the issue of the Rogun Dam, for the best solution we need firstly to get the 'will' of the leaders.

Eventually, although the upstream countries are not able to finance the hydropower projects and even the restoration of the old-generated assets, the downstream countries are stronger economically; so unlike the upstream countries, Uzbekistan and Kazakhstan can build their own reservoirs. In other words, as stated by Sorg and his colleagues (2014, p. 73), Uzbekistan and Kazakhstan can make investments to construct 'backup-reservoirs' with which they can regulate the water flow for their own needs.

To sum up, this chapter suggested that the Kambarata Dam-1 might tense the relations between upstream Kyrgyzstan and downstream Kazakhstan and Uzbekistan. Even

[136] The mentioned projects are not only the projects that help the countries improve their energy output and increase their economies but they are also considered as symbols of state power for the people (Wooden, 2014, p. 465). These kinds of missions given to such projects are seen to be related to future of the Uzbek people and their lives, so such 'symbolisms' play crucial roles to motivate and mobilize the population (Menga, 2015, pp. 480-482).

though it is generally claimed that the Kambarata Dam-1 is more negotiable and less conflictual the Rogun Dam, according to one study the probability of interstate tensions over the Kambarata Dam-1 is equal to the Rogun Dam.[137] For that reason, this chapter also suggested some ways to solve the problem.

[137] The probability of the tension over the Kambarata Dam-1 between upstream Kyrgyzstan and downstream Uzbekistan and Kazakhstan is 3.5. https://library.ecc-platform.org/conflicts/dam-conflict-between-kyrgyzstan-and-uzbekistan (accessed on November 28, 2016).

CHAPTER 5

CONCLUSION

This thesis analyzed the impact of the disagreements among Central Asian countries over the issue of water allocation from the transboundary waters of Amu Darya and Syr Darya. While the upstream countries of Kyrgyzstan and Tajikistan want to utilize their hydropower potential by constructing HPPs, the downstream countries of Uzbekistan and Kazakhstan object to such attempts because of their need for water for the purposes of irrigation. Also, this thesis analyzed the impact of the Rogun Dam on the relations between Tajikistan and Uzbekistan on the one side and the impact of the Kambarata Dam-1 on the relations between Kyrgyzstan as the upstream country and Kazakhstan and Uzbekistan as the downstream countries on the other.

As mentioned in the Introduction, unconventional security threats have gained more importance in the post-Soviet era because these threats started to degrade the quality of life of a nation or limit the nation's policy options. One of the unconventional security threats is water which especially became significant in Central Asia in the post-Soviet era. As stated by Mosello (2008, p. 153), the meaning of water changed with the end of the Cold War and management of it became associated with security concerns. This phenomenon of securitization of water also affected Central Asia in the post-Soviet era and water became another issue (in addition to separatist movements, ethnic conflicts, and religious fundamentalism) that threatens the internal security of Central Asia.

In the second chapter, the history of water management was analyzed. Historically, there have been five paradigms of water management up until the disintegration of the Soviet Union, all of which were described in the chapter. In this chapter water management issue after 1991 was also analyzed in order to show the experiences of

Central Asian countries after independence. In other words, while all aspects over water allocation were controlled by the central government before independence, the countries started to follow their own individual interests starting with 1991. Consequently, the unilateral steps taken in favor of their 'national interests' created the water problem in Central Asia in the post-Soviet era.

Nevertheless, newly-independent countries made some agreements to preserve the 'energy-water nexus' such as the Almaty Agreement, the Kyzl-Orda Agreement, the Bishkek Agreement, the Ashgabat Declaration, and the Dushanbe Declaration. In addition to these agreements, Central Asian countries formed some institutions over the water management issue such as the ICWC, the IFAS, the CAREC, and the ICAS as mentioned in this thesis. Nonetheless, the water management problem is still on the table.

In the third chapter, some information on Amu Darya and some economic and water related data on Tajikistan and Uzbekistan were given. Moreover, in this chapter the history of the Rogun Dam was given. The dam was first developed (but not completed) as a project in 1974 by the Soviet government, but it was put on the agenda by Tajikistan once again after independence. This chapter also analyzed the impact of the dam on the relations between Tajikistan and Uzbekistan.

In the fourth chapter the other project that creates problems in the region, the Kambarata Dam-1 in Kyrgyzstan was analyzed. Just as the Rogun Dam, Kambarata projects were initiated during the Soviet era but remained uncompleted. Although the first project did not get any reaction from downstream countries of Kazakhstan and Uzbekistan, these two countries harshly criticize the second dam because they believe that Kyrgyzstan will control all water flow in the river once this project is completed.

Consequently, all parties of these conflicts try to maximize their national interests even though they harm the rights of their neighbors to benefit from water. As a result of these conflicting interests, social tensions in the region may emerge between the upstream and downstream countries. Although the region is secure with respect to quantity of water as stated in Introduction, effective solutions have to be found to

prevent the emergence and escalation of local conflicts in the region. In other words, water does not yet has the potential to cause a war in the region but it definitely has the potential to cause tensions, the result of which cannot be predicted. Therefore, water-related conflicts may threaten regional security because if the countries cannot solve their problems over the use of water, they may end up becoming hostile neighbors, even if no war emerges.

In such a case, the region might be the next Middle East where the chaos became almost a life-style. In that scenario there will be no powerful governments that rule these countries so people who live in the region will face the danger of living in anarchy. I claim that Central Asia might be the next Middle East because Islamic insurgency in the region has become increasingly more popular among people, especially after the Arab Spring. That is to say, if the region in general and countries in particular lose their stability and if people lose their security and hope, terrorism might dominate the region. Therefore, Central Asian leaders have to reflect upon this threat and take appropriate steps to prevent it. Therefore, the first thing they need to consider is to solve the water management issue that threatens the stability in the region as stated in this thesis.

Another important point that needs to be mentioned is that the countries in the region are economically interdependent. To illustrate, Uzbekistan, being one of the most powerful countries in the region has no direct access to other countries in the region in order to export its products. Therefore, it has to use the lands of its neighboring countries. Likewise, almost 20 % of export of Tajikistan goes to Turkey but since Tajikistan has no border with Turkey it depends on its neighbors to transmit its exports (CIA, 2016d). This is more or less the same for the other countries. Thus, if the Central Asian countries cannot find a permanent solution to the water problem, this will not only affect regional security, but also economy of these countries.

As analyzed in this thesis, there are many strategies and ways that can be followed by the regional countries either for mitigating the tensions or for finding a solution such as establishing a solid legal framework with a holistic approach, restoration of already-signed agreements like the Bishkek Agreement in 1998, rehabilitation of the old-

fashioned assets, changing the irrigation system, and renovation of the existing infrastructures. Therefore, although there are many ways to solve the problem of water use, these solutions all depend of the political will. In other words, the critical question is that to what extend the countries/leaders want solution. As stated by a scholar if there is a political will to peace, water is not an obstacle but if someone wants to find a reason to fight, water gives many opportunities (Blank, 2010, p. 67). In other words, water-related tensions in Central Asia do not stem from issues of technical difficulties or feasibility. There tensions can be solved, conflict can be mitigated and sustainable development can be achieved if leaders show strong political will.

To sum up, the Central Asian countries/leaders have to stop harming the interests of their neighbors and try to find a solution with which all parties gain ground. In other words, instead of harming each other, the Central Asian countries have to be part of a comprehensive cooperation. As stated in the report of International Crisis Group (2014): "Water problems – when combined with poverty, social tensions, environmental degradation, ineffectual leadership, and weak political institutions – contribute to social disruptions that can result in state failure."

Transboundary water do not necessarily be a source of conflicts they may be opportunities of cooperation as well. Such cooperation is the only way to provide development and stabilize the region. Furthermore, if the water-induced tensions eventually lead to war, social, political, and economic costs would be extremely high. Even if so far water was not the reason of war, it may be a triggering factor in the future to initiate war in Central Asia (Jenkins-Young, 2013).

It must also be kept in mind that water is considered to be the oil of the 21st century. In other words, water will be as valuable and important as oil was in the 20th century. Therefore, if the countries in the world in general and Central Asian countries in particular are not able to solve their problems over water use, they may not have even have such a problem to solve it in the future. In other words, today Central Asia is one of the few lucky regions in the world that has enough water, but in the near future due to the climate change this may not be the case at all. Therefore, if water management problem is not solved in the region, not only management but also scarcity will be the

reason of competition and tension. As is stated in a report on climate change in Central Asia, unless Central Asian countries collaborate in managing their water resources, political tensions may emerge (Frenken, 2013, p. 72). However, it must also be noted that even if there is no effective cooperation in the region, water management issue may not turn into a full-fledged war due to the interests of global powers in the region such as the US, China, and Russia. There countries may not allow any confrontation to cause instability in the region in which they have many interests. According to another study, the glaciers in Central Asia lose almost as much war as consumed by Switzerland every year (Trilling, 2016).[138] Therefore, the water management issue should be solved not only in an effective way but also as soon as possible before the scarcity makes the issue impossible to solve.

The final point that needs to be mentioned is related to the attitude of the acting president of Uzbekistan, Shavkat Mirziyoyev. The new president, unlike the recently deceased president of the country Islam Karimov who put the hydropower dams at the center of the relations with Tajikistan and Kyrgyzstan, has a different attitude. The new president seems to be putting emphasis on more friendly relations with the neighboring countries and thus may be a good sign in terms of finding a long-term solution to the problems of use of transboundary waters in Central Asia.

[138] Many glaciers have either disappeared or retreated in the region (Peachey, 2004). By 2050, 20 % of glaciers in Kyrgyzstan will melt and the glaciers in Tajikistan will be lost 1/3 of their area (Blank, 2010, p. 66).

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APPENDICES

SOVYET SONRASI ORTA ASYA'DA SU YÖNETİMİ SORUNLARI

A. TURKISH SUMMARY / TÜRKÇE ÖZET

Sovyetler Birliği döneminde merkezi yönetim tarafından idare edilen su, 1991 yılının Aralık ayında Birliğin dağılmasıyla Orta Asya ülkeleri arasında sorunların kaynağını teşkil etmiştir. Yukarı kıyıdaş ülkeler olarak bilinen Kırgızistan ve Tacikistan suyu hidroelektrik üretiminde kullanmak için adımlar atarken, aşağı kıyıdaş ülkeler olan Kazakistan ve Özbekistan suyu tarımsal faaliyetlerde kullanmak üzere talep ettiklerinden bu duruma şiddetle karşı çıkmaktadırlar. Ve bu karşı çıkış Birliğin yıkılış tarihi olan 26 Aralık 1991 yılından itibaren su yönetiminin bölgede sorunlara yol açmasına sebep vermektedir. Bu tez su yönetiminin bölgede yarattığı sorunların kaynağı olan Tacikistan tarafından yapılmak istenen Ceyhun Nehrin üzerindeki Rogun Barajı ve Kırgızistan tarafından inşa edilmesi için uğraşılan Seyhun Nehri üzerindeki Kambarata-1 Barajı'nın bölge ülkeleri arasındaki ilişkileri nasıl etkileyeceği üzerinde durmakta ve ayrıca bölge ülkelerinin söz konusu sorunları çözüme kavuşturabilmeleri adına bazı çözüm önerileri sunmaktadır.

Uzmanların da bildirdiği üzere insan hayatı için çok önemli bir konumda bulunan suyun kullanımı 20.yy'da nüfusun artışıyla birlikte 7 misli artmış ve bu da suyun miktarının azalmasına sebebiyet vermiştir. 2050 yılına kadar da dünya nüfusuna 3 milyardan fazla insanın katılacağı ve bunun da su kullanımını yaklaşık olarak % 80 artıracağı hesaba katılırsa yakın gelecekte su çok daha az bulunur bir madde olacaktır. Bugün bile küresel ısınma ve kirlilik gibi çeşitli nedenlerden ötürü yaklaşık 800 milyon insan su kıtlığının olduğu bölgelerde yaşıyor iken 2025 yılına gelindiğinde bu rakamın 1.8 milyarı bulacağı tahmin edilmektedir.

Bu derece az kalan ve azalmaya meyilli olan su kaynağı sadece insanların yaşamını değil aynı zamanda ülkelerin ve bölgelerin güvenliğini ve istikrarını da tehlikeye sokmaktadır. Zira uzmanların da belirttiği üzere kısıtlı kaynaklara erişim ülkeler tarafından güvenlik meselesi olarak değerlendirilir. Fakat bütün bunlara rağmen günümüzde su ile ilgili yaşanılan problemler onun miktarı azlığı ile ilgili değildir. Asıl problem su yönetimiyle alakalıdır. An itibari ile dünyada 276 tane sınıraşan nehir havzası ve 200 adet sınıraşan yeraltı su havzası mevcuttur ve yaklaşık olarak 150 ülke bu kaynakları paylaşmaktadırlar. Fakat bu kaynaklar ülkeler arasında zaman zaman sorunlara neden olmaktadırlar.

Bu ülkelerden 4 tanesi bu tezin konusu olduğu üzere Orta Asya coğrafyasında bulunan Kırgızistan, Tacikistan, Kazakistan ve Özbekistan'dır. Bu dört ülkenin arasında sorun teşkil eden sınıraşan sular ise Ceyhun ve Seyhun Nehirleridir. 1991 yılından önce merkezi idare tarafından yönetilen bu sular yukarıda da belirtildiği üzere ülkelerin bağımsızlıklarını kazanmalarıyla milli idare tarafından yönetilen sular konumuna gelmiş ve ülkeler arasında sorunlar yaşanmasına sebep olmuşlardır.

Su yönetiminin nasıl bir güvenlik tehdidi haline geldiğini inceleyecek olursak da yine Soğuk Savaşın bitim tarihi olan 1991 yılına bakmamız gerekmektedir. 1991 yılından önce güvenlik tehdidi olarak algılanan etkenler askeri terimlerle ifade ediliyordu. Fakat Soğuk Savaşın bitmesiyle uzmanlar ekonomik, sosyal, politik ve hatta çevresel etkenlerin de ülkelerin ve bölgelerin güvenliklerini tehdit edebileceklerini belirtmeye başlamışlardır. Ve bu çerçevede 'yeni güvenlik tehditleri' olarak adlandırılan tehditler önem kazanmıştır. Uzmanların çoğu yeni güvenlik tehditlerini sıralarken terörizm, uluslararası uyuşturucu ticareti, organize suçlar ve siber saldırı gibi olguları ön planda tutarlarken, kimi yazarlar 'su'yun daha doğru bir ifadeyle 'su yönetiminin' de bir güvenlik tehdidi olarak algılanması gerektiğini savunmuşlardır. Bu yazarların ortak görüşü 1991 yılından evvel 'ortak trajedi' olarak algılanan suyun Soğuk Savaşın bitmesiyle birlikte 'su yönetiminin güvenlileştirilmesi' şeklinde tanımlanmaya başlanmasıyla ülke ve bölge güvenliği için tehdit haline geldiğidir. Suyun geçirdiği bu dönüşüm de onun teknik değerlendirme dışına çıkıp güvenlik politikası haline gelmesine yol açmış ve ülkeler arası ilişkilerin önemli bir parçası haline gelmiştir.

Su güvenlik politikaları çerçevesinde tartışılmaya başlanması başka bir konuyu daha gündeme getirmiştir: Su yönetimi ile ilgili sorunlar ülkeler arasında savaşlara mı yol açacak yoksa su yönetimi kaynaklı sorunlar işbirliği ile çözülebilir mi? Peter Gleick, Joyce Starr, John Cooley, John Bullock ve Adil Darwish gibi düşünürler suyun ülkeler arasında savaşlara sebebiyet verebileceğini savunurlarken, Aaron Wolf, Lucy Jenkins-Young ve Josefina Maestu gibi düşünürler su yönetimi dolayısıyla oluşan sorunların savaşlardan ziyade işbirliği yöntemi ile çözülebileceğini ifade etmektedirler.

Bu tez ise yeni güvenlik tehdidi olarak görülen su yönetiminin Orta Asya'da işbirliği yöntemi ile çözüme kavuşturulabileceğini savunmaktadır.

Orta Asya'da su yönetim problemlerinin temeli çok yakın tarihe dayanıyor olsa da su yönetiminin bilinenin aksine çok köklü bir geçmişi vardır. 5 paradigma şeklinde incelenebilecek su yönetimi bölgede 3 farklı yönetim modelinde gerçekleşmiştir. İlk paradigma denilen ve Çarlık Rusya'sının bölgeye hakim olmasına kadar süregelen dönemde *mirab* ve *arık-aksakallar* tarafından sevk ve idare edilen su, Çarlık Rusya idaresini simgeleyen ikinci paradigmada ise Türkistan Bölgesi Tarım ve Devlet Mülkleri Birimi tarafından yönetilmekteydi. Geriye kalan 3 paradigma Sovyetler Birliği döneminde uygulanan farklı politikaları temsil etse de bu dönemde su ve su ile ilgili bütün konular Su Yönetim Bakanlığı tarafından kontrol edilmekteydi.

Sovyetler Birliği döneminde su yukarı kıyıdaş ülkeler tarafından aşağı kıyıdaş ülkelerin tarım ürünlerini sulamaları için yazın serbest bırakılırken, bunun karşılığında petrol ve doğalgaz zengini olan aşağı kıyıdaş ülkelerden kışın kullanım için enerji temin etmekteydiler. Seyhun Nehrinin kullanımını düzenleyen ve 1984 yılında kabul edilen 413 sayılı protokol gereği Özbekistan suyun % 46'sını kullanmaya muktedirken, Kazakistan % 44 ve Tacikistan da % 8'ini kullanmaktaydı. Bir diğer protokol olan ve Ceyhun Nehrinin su kullanımını düzenleyen 566 sayılı protokolde ise suyun yarısına yakınını Özbekistan, % 36'sını ise Türkmenistan kullanırken, kaynak ülke konumundaki Tacikistan'ın kullanım miktarı sadece % 15.4 idi. Söz konusu protokoller çerçevesinde yukarıdaki şekliyle idare edilen su 1991 yılında Sovyetler Birliği'nin dağılmasıyla birlikte sorunlu hale gelmiştir. Her ne kadar ülkeler bağımsızlık sonrası dönemde 'enerji-su bağı' şeklinde tanımlanan bu yapıyı korumak

adına çeşitli anlaşmalara imza atsalar da sorun hala geçerliliğini korumakta ve bölge istikrarına tehditler oluşturmaktadır.

Söz konusu anlaşmalardan kısaca bahsetmek gerekirse karşımıza şöyle bir liste çıkmaktadır: 1992 Almatı Anlaşması, 1993 Kızılorda Anlaşması, 1995 Daşoğuz Zirvesi, 1995 Nukus Deklarasyonu, 1997 Almatı Deklarasyonu, 1998 Bişkek Anlaşması, 1999 Aşkabat Deklarasyonu, 2001 Duşanbe Deklarasyonu ve çeşitli ikili anlaşmalar. Bunların ötesinde denetim ve kontrolü sağlamak amacıyla çeşitli komisyonlar da kurulmuştur. Bütün bu imzalanan anlaşmalara ve atılan adımlara rağmen şu ana kadar herhangi somut bir gelişme yaşanmamış ve sorun hala varlığını devam ettirmektedir.

Sovyetler Birliği döneminde uygulanan su politikalarında öncelik sadece pamuk üretimi değildi. Pamuğun yanında Sovyet yönetimleri Birliği dünyanın en büyük hidroelektrik üreticisi yapma yolunda çeşitli adımlar atmışlardır. Bu adımlardan ilki ve en önemlisi 1924 yılında kurulan ve sonradan 'Orta Asya Sulu Tarım Bilim ve Araştırma Enstitüsü' olarak da bilinen 'Orta Asya Su Yönetimi Deney Araştırma Enstitüsü'nün kurulmasıdır. Büyük çaplı hidroelektrik projelerinin ve hidrolik yapılarının modellemesinin yapıldığı ve test edildiği bu enstitünün çalışmaları sonucunda birçok baraj ortaya çıkmıştır ki Toktogul, Nurek, Tutamyun ve Farkhad Barajları bunlardan sadece belli başlı olanlarıdır. Yine bu enstitünün testleri ve modellemeleri sonucu yapımlarına başlanan fakat yapımları Sovyetler Birliğinin dağılması sonucu yarım kalan iki tane daha baraj var ki Sovyetler Birliğinin dağılması sonrasında Orta Asya coğrafyasında su yönetiminin ülkeler arasında sorunlara yol açmasına sebep vermişlerdir: Rogun Barajı ve Kambarata-1 Barajı.

Bölge ülkeleri arasında sorun yaratan barajlardan biri Tacikistan tarafından yapımına başlanılan fakat Özbekistan tarafından çeşitli sebeplerle şiddetle eleştirilen Rogun Barajıdır. 1959 yılında Sovyet mühendisler tarafından teklif olarak sunulan ve 1980 yılına gelindiğinde yapımına başlanan 3600 MW'lık potansiyeli olan Rogun Barajı Sovyetler Birliği'nin dağılmasıyla tamamlanamadan kalmıştır. Fakat 2004 yılında Tacikistan Başkanı İmamali Rahman projenin kaldığı yerden devam edeceğini açıklamış ve Rusya ile inşa konusunda anlaşma imzalamıştır. Söz konusu anlaşma

tarafların çeşitli konularda ihtilafa düşmesi dolayısıyla 2007 yılında iptal edilmiş olsa da İmamali Rahman 2008 yılında Rogun Barajının yapımının başlayacağını ilan etmiştir.

Tacik tarafının değerlendirmesi ile ülkenin enerji ihtiyacını karşılamanın yanında çeşitli projelerle (CASA-1000-bu proje Tacikistan ve Kırgızistan'ın fazla ürettikleri elektriğin Afganistan ve Pakistan gibi elektrik sıkıntısı çeken ülkelere ihraç edilmesini öngörmektedir.) ülkenin ekonomisinin gelişmesine ve ayrıca bölgeye ekilebilir alan yaratma konularında da faydası olacak olan Rogun Barajı, Ceyhun Nehri'nin bir diğer paydaşı olan Özbekistan'ın tepkisiyle karşılaşmıştır. 335 metre gibi bir yükseklikle dünyanın en büyük barajı olamaya aday olan Rogun Barajı Özbekistan'ın merhum Başkanı İslam Kerimov başta olmak üzere birçok hükümet mensubunca eleştirilmiş ve hatta söz konusu barajın bölgede su kaynaklı savaşlara sebep verebileceği defaten ifade edilmiştir.

Ekonomisinin % 20'i tarıma bağlı olan ve halkının % 25'inden fazlasının tarım sektöründe çalıştığı Özbekistan'ın suya bağımlılığının da % 80 dolaylarında olduğu göz önüne alındığında ve barajın yapımı için uygun görülen yerin deprem bölgesinde olması dolayısıyla olası bir afetin felaketle sonuçlanabileceği düşünüldüğünde söz konusu baraj yapımından rahatsız olması normal karşılanabilir olsa da bu sorun çözümsüz değildir.

Çözüm yollarından bir tanesi Özbekistan'ın su kullanım miktarını azaltmasıyla ilgilidir ki burada iki yöntem devreye girmektedir. Yöntemlerden bir tanesi Özbekistan'ın sulama yöntemini değiştirmesidir. Özbekistan hendek sistemi adı verilen sistemle mevcut suyunun % 50 ile % 90'lık kısmını boşa harcamaktadır. Uzmanların belirttiği şekliyle damla sulama sistemine geçmesi durumunda ise Özbekistan 9 km^3 daha az su harcayacak ve bu da sudan doğan sorunların hafiflemesine yol açacaktır. Diğer bir yol ise Özbekistan'ın başlıca tarımsal ürünü olan ve ekonomisinin büyük bir kısmını karşılayan pamuktan feragat ederek en azından üretim miktarını düşürerek yoğun su kullanımından kurtulmasıdır. Bu iki öneriye rağmen Özbekistan ne sulama sisteminde ne de pamukta her hangi bir değişiklik yapmayı reddetmekte ve bu çözüm önerilerini kabul etmemektedir.

Bu önerilerin haricinde de çeşitli yöntemler mevcuttur ki bu yöntemlerden bir tanesi Özbekistan'ın da destek vermekten imtina etmeyeceğini belirttiği Tacikistan'da mevcut olan eski hidroelektrik tesis ve varlıklarının yenilenmesidir. Bu yöntem sayesinde % 75'lere varan kayıpların önüne geçilebileceğini iddia eden uzmanlar, Tacikistan'ın bu öneriye olumlu yaklaşması halinde Rogun Barajı yapımından doğacak sorunların ortadan kalkacağını zira böyle bir durumda Rogun gibi büyük bir barajın yapımının gerekli olmayacağını ve daha küçük baraj yapımıyla gerekli olan enerjinin sağlanabileceğini savunmaktadırlar. Diğer bir deyişle, eğer Tacikistan eski varlıklarını yenileme yoluna giderse hem ülke içi kullanım için gerekli olan enerjiyi sağlamış olacak hem de ülke ekonomisinin gelişmesi için oluşturulan projelerde kullanım için fazla elektrik üretimini sağlayabilecektir.

Ülkelere sunulan bireysel önerilerin ötesinde iki ülkenin ortak olarak atabilecekleri adımlar da vardır. Örneğin, iki ülke bir araya gelerek uluslararası hukuku göz önünde bulundurarak hazırlayacakları bir anlaşmayla bu sorunu çözebilirler. Her iki tarafın da çıkarlarını koruyarak hazırlanabilecek olan söz konusu yasal çerçeve suyun nasıl ve ne şekilde yönetileceğini belirterek oluşturacağı sistemle sorunun daha etkin bir şekilde çözüme kavuşmasını sağlayabilir. Ayrıca, benzer sorunlarla mücadele eden çeşitli ülkelerin yaptıkları gibi oluşturulacak bir İhtilaf Çözüm Mekanizmasıyla ileride oluşabilecek sorunlara karşın da önlemler alınabilir.

Bir diğer baraj ise yine Sovyetler Birliği döneminde yapımına başlanılan ve yapımı bitirilmeden yarım kalan Seyhun Nehri üzerindeki Kambarata-1 Barajıdır. Kırgızistan'ın enerji sorununu bitirmek için başlatılan söz konusu baraj yalnızca Özbekistan tarafından değil aynı zamanda Kazakistan tarafından da eleştirilmektedir. 1986 yılında yapımına başlanan Kambarata-1 Barajı tıpkı Rogun Barajı gibi tamamlanamamış fakat Sovyet sonrası dönemde Kırgızistan yönetimi tarafından yapımının devam ettirileceği beyan edilmiştir. Asıl itibariyle Kambarata Barajları sistemi olarak adlandırılan bu sistemin diğer parçası olan Kambarata-2 Barajı hem daha az kapasiteli hem de daha küçük olması hasebiyle Kazakistan ve Özbekistan tarafından eleştirilmemiş ve yapımına müsaade edilmiştir. Fakat öngörüldüğü gibi Kambarata-2 Barajı Kırgızistan'ın enerji sorununa çare olmamıştır. Bu çerçevede

2010 yılında Kırgızistan sistemin diğer parçası olan Kambarata-1 Barajının yapımına başlamıştır.

2010 yılında yapımına başlanan 245 metre yükseklik ve 1900 MW güç ile Seyhun Nehri üzerindeki en büyük ve en güçlü baraj olma özelliği taşıyan Kambarata-1 Barajı'na itirazlar da ardından gelmiştir. Tıpkı Rogun Barajı'nda olduğu gibi itirazlarını sıralayan Özbekistan'ın yanına bu sefer Kazakistan da eklenmiş ve barajın yapımını durdurmak için çeşitli adımlar atmışlardır. Bu çerçevede, örneğin, Özbekistan 2013 yılında gaz arzını kesmiş ve Kırgızistan'a giden yolları da kontrolüne almıştır. Ayrıca son dönemde yine Özbekistan silahlı kuvvetlerini Kırgızistan sınırına yerleştirmiş ve komşusuna bir nevi gözdağı vermiştir. Özbekistan kadar sert olmasa da Kazakistan da itirazlarını belirtmiş ve söz konusu barajın yapımı durumunda bölgedeki 'hassas denge'nin bozulabileceğini ifade etmiştir. Bu süreç içerisinde Kırgızistan da çeşitli adımlar atmış ve bir nevi konunun kangren olmasına sebebiyet vermiştir. Örneğin, 2013 yılında Özbekistan'ın hamlelerine karşılık Büyük Namangan Kanalı'nın onarımını bahane göstererek Özbekistan'a giden suyu kesmiş ve bir nevi doğalgazı baskı aleti olarak kullanan komşusuna karşılık suyu baskı mekanizması haline getirmiştir.

Söz konusu bu üç ülkenin ilişkileri Kambarata-1 Barajı tartışmalarından önce de çok normal seyrinde ilerlemiyordu. Bu üç ülke Kambarata-1 Barajı öncesinde de gergin ilişkilere sahipti ve bu gergin ilişkinin sebebi de yine bir barajdı: Toktogul Barajı. 1974 yılında Sovyet idaresi tarafından yapımına başlanan 1200 MW güce sahip Toktogul Barajı yukarıda bahsedilen 'enerji-su bağı' denklemi çerçevesinde yönetiliyor ve yazın tarım için kullanılırken kışın su Kırgızistan tarafından tutuluyordu. Bu dönemde suyun % 75'lik kısmı yazın kullanılırken, kış kullanımı sadece % 25 seviyesindeydi. Fakat, bağımsızlığın kazanılmasıyla 413 sayılı protokolle düzenlenen bu durum ülkeler arasında ihtilafların doğmasına sebep oldu ve sonucunda Kırgızistan Toktogul Barajı'nın kullanımında değişikliğe gitti. Bu değişiklikle Toktogul Barajı'nın amacını sadece sulu tarımı desteklemekten çıkaran Kırgızistan aynı zamanda enerji ihtiyacını karşılamak için kışın su salınımını arttırdı. Ve sonucunda 1991 yılından önce suyun %

75'i yazın kullanılırken bu oran 1991-2000 yılları arasında % 45'e düştü. Suyun akışındaki bu değişim de dolayısıyla üç ülkenin ilişkilerinin gerilmesine yol açtı.

Bütün bu gerilen ilişkilere rağmen Kambarata-1 Barajı dolayısıyla oluşan sorunların da çözümü mevcuttur. Bunlardan ilki tıpkı Tacikistan'ın yapması önerildiği gibi Kırgızistan'ın da eski hidroelektrik tesis ve varlıklarını yenilemesi ve bu sayede Kambarata-1 Barajına olan ihtiyacı bitirmesidir. Uzmanların ifade ettiği şekliyle eğer Kırgızistan eski tesislerini yenileme yoluna giderse inşa edeceği (ki yaklaşık 100 adet küçük baraj inşa etme potansiyeli var) daha az kapasiteli barajlarla hem ülke içi kullanıma yetecek kadar elektriğe sahip olacak hem de yukarıda belirtilen CASA-1000 projesiyle ekonomisini geliştirebilecektir. Fakat Kırgızistan'ın ekonomisinin böyle bir yenilenmenin yükünü tek başına kaldırabilecek kadar gelişmiş olmadığı göz önüne alınırsa burada Kazakistan ve Özbekistan'ın yardımlarının çözüme yaklaşmada önemli olacağı da belirtilmelidir.

Bir diğer çözüm yolu üç ülkenin bir araya gelerek yeni bir anlaşma imzalamaları veya en azından 1998 yılında imzaladıkları Bişkek Anlaşmasını revize etmeleridir ki bu noktada Kazakistan ve Kırgızistan tecrübelidir. Zira bu iki ülke imzaladıkları Chu-Talas Anlaşmasıyla bölgede kalıcı barışı sağlamışlardır.

Diğer bir çözüm yolu ise Kazakistan ile Özbekistan'a önerilmektedir. Kırgızistan'ın az gelişmiş ekonomisinin aksine Özbekistan ve Kazakistan ekonomik olarak çok daha ileri seviyedelerdir. Bu da söz konusu iki ülkenin kışın salınan suyun tutulabilmesi ve yazın kullanıma açılması için yapacakları 'yedek' rezervuarlarla kendi çözümlerini kendilerinin üretmelerini sağlayabilecektir.

Uzmanların ortak görüş olarak belirttiği konulardan biri de bu iki barajın yapılabilirliği üzerinedir ki bu konu üzerinde durulmaya değer bir konudur. Uzmanlar Kambarata-1 Barajının Rogun Barajı ile mukayese edildiğinde daha yapılabilir olduğunu zira Özbekistan'ın Rogun Barajına olan eleştirilerinin çok daha sert olduğunu ifade etmektedirler. Fakat ortada unutulan bir nokta vardır: Kırgızistan ve Tacikistan'ın ekonomileri. Bu iki ülke söz konusu barajların yapımını tek başlarına üstlenebilecek ekonomilere sahip değildirler çünkü projelerin öngörülen masrafları 3-4 milyar dolar

seviyelerindedir. Dolayısıyla barajların yapılabilir olmasında komşu ülkelerin itirazı sorunu halledilebilir olsa da eğer projelerin yapımı için gerekli olan finansman sağlanamazsa projeler tamamlanamaz olurlar. Bu konuda da Tacikistan Kırgızistan ile kıyaslandığında daha başarılıdır zira Tacikistan 2016 yılının sonlarında İtalyan Salini Impregilo firması ile Rogun Barajı'nın yapımı üzerine anlaşma imzalamışlardır. Diğer taraftan, Kırgızistan Rusya ile 2012 yılında yaptığı anlaşmayı 2016 yılının başlarında iptal etmiş ve Kambarata-1 Barajı için elinde yatırımcı kalmamıştır. Dolayısıyla her ne kadar Özbekistan ve Kazakistan Kambarata-1 Barajı için daha ılımlı olsalar da Kırgızistan yatırımcı bulamadığı taktirde barajı tamamlaması mümkün görünmemektedir.

Sonuç olarak, bu tez 1991 yılından sonra Orta Asya coğrafyasında yaşanan su yönetimi sorununu yapılması planlanan Rogun ve Kambarata-1 Barajları üzerinden anlatmıştır. Devamında, bu sorunların büyüyerek daha da ciddi sonuçlar vermesini önlemek adına çözüm yolları sunmuştur. Her ne kadar teknik anlamda sunulan çözümlerin geçerliliği olsa da birçok uzman Orta Asya'daki su yönetim sorununun teknik veya fizıbil olmadığını sorunun tamamıyla politik olduğunu savunmaktadırlar. Politik sorunların çözümünün de teknikten ziyade 'politik istekte' gizli olduğu görüşünde ortak beyanda bulunmaktadırlar. Dolayısıyla, yukarıda sayılan çözüm önerilerinin geçerli olabilmesi ve bölgede su yönetiminden kaynaklı sorunların nihayete kavuşması için ülke liderlerinin çözümü destekleyici adımlar atması gerekmektedir. Bu zamana kadar böyle bir adım atılmamış ve hatta kimi liderler su yönetiminden kaynaklı sorunların bölgede savaşa dahi yol açabileceği şeklinde sert açıklamalarda bulunmuşlardır. Fakat bu tarz açıklamaların bölgedeki istikrara zarar vermekten başka bir sonuç vermediği ortadadır.

Eğer bölge ülkeleri bu sorunun çözümsüzlüğünde ısrar ederler ise bölgede istikrarın ve güvenliğin sarsılmasından başka sorunların yaşanmasına sebebiyet vereceklerdir. Bu sorunların en önemlisi ortak geçmişe sahip bölge ülkelerinin birbirlerine düşman hale gelmesidir ki ülkelerin düşmanlıkları halklara da sirayet ederse sonuçlarının tahmin edilmesi pek mümkün olmayacaktır.

Diğer bir sorun da ekonomiktir. Bilindiği üzere 1924 yılında Sovyetler Birliği döneminde bölge ülkeleri arasına sınırlar çekilmiş fakat bu sınırlar hiçbir zaman kabul görmemişlerdir. 'Keyfi' olarak çizilen bu sınırların ortaya çıkardığı sorunlardan bir kısmı Fergana Vadisi bölgesinde karşımıza çıkmaktadır. Çizilen sınırların demografik olarak karıştırdığı bölgenin ötesinde ülkelerin sınırlarının da birbirleri içerisine girmesi gibi bir durumu Sovyet sonrası döneme miras kalmıştır. Bu çerçevede bölge ülkeleri bağımsızlıktan sonra da birbirlerine bağımlı kalmışlardır. Örneğin, ihracatının % 20'ini Türkiye'ye yapan Tacikistan malların geçişi için komşu ülkelere muhtaçtır ki bu durum diğer ülkeler için de geçerlidir. Dolayısıyla, eğer su sorunu çözüme kavuşturulmazsa bölgede sadece güvenlik tehlikesi olmayacak aynı zamanda bölge ülkeleri ekonomik olarak da güçsüz konuma geleceklerdir.

Sonuç olarak, Orta Asya ülkeleri/liderleri kendi çıkarları uğruna komşularının çıkarlarına zarar vermekten vazgeçmeli ve kapsamlı bir işbirliği ile soruna çözüm bulmaya çalışmalıdırlar çünkü yoksulluk, çevre kirliliği, sosyal gerginlikler vb. durumlarla birleştiğinde su sorunları sosyal bozulmaları tetikler ve devletler yıkılma ile karşı karşıya kalırlar.

Orta Asya özelinde işbirliği ülkelerin çıkarları açısından da en faydalı yöntem olarak karşımıza çıkmaktadır. Maksud Bekchanov ve ekip arkadaşlarının belirttiği üzere eğer Orta Asya ülkeleri işbirliği yoluna giderlerse sulu tarımdaki kayıp sadece % 1 olacak iken hidroelektrik üretiminde % 93'lük bir kazanç elde edilebilecek ve bu da bölge ülkelerinin toplam kazancını % 8 artırmış olacaktır. Diğer türlü bölgenin kaybı % 18'lere kadar ulaşabilecektir.

Her ne kadar tezin konusu suyun yönetim sorununun problem yarattığı şekilde ifade edilmiş olsa da Orta Asya'nın yakın gelecekte su erişiminde sıkıntı yaşayacağı bilinmektedir. Diğer bir ifadeyle, Orta Asya ülkelerinin su sorununu sadece kapsamlı ve efektif bir biçimde çözmesi yeterli olmayacak bu çözümü mümkün olduğunca kısa sürede bulması gerekecektir. Zira, yakın gelecekte çözmek için üzerinde çalışması gereken suyu bulamama tehlikesiyle karşı karşıyadır. Bu noktada Özbekistan'ın şimdiki Başkanı Şevket Mirziyoyev'in tutumuna da değinmeden geçemeyeceğim. Şimdiki Başkan merhum İslam Kerimov'un aksine su yönetimi ile ilgili olan sorunları

bölge ülkeleriyle olan ilişkilerinin merkezine koymaktan uzak durmakta ve ülkelerle daha iyi ilişkiler geliştirmek için çabalamaktadır. 16 Kasım 2016 günü Tacikistan Enerji ve Su Kaynakları Bakanı Yardımcısı Sultan Rahimzoda ile Özbekistan Dışişleri Bakanı Abdulaziz Komilov'un Rogun Barağı üzerine yaptıkları görüşme bu duruma örnek teşkil etmektedir. Dolayısıyla, yeni Başkanın bu tutumu bölgede uzun soluklu ve kalıcı çözümün gelmesi için önemli bir dönüm noktasıdır.

B. TEZ FOTOKOPİSİ İZİN FORMU

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Adı : Emre

Bölümü : Avrasya Çalışmaları

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