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Challenges of transboundary water governance in Afghanistan

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Abstract

Afghanistan has five major river basins which four of them are transboundary and shared with Iran, Pakistan and Central Asian Countries (Tajikistan, Uzbekistan, Turkmenistan). Transboundary water governance and bilateral or regional agreements and cooperation with riparian countries have always been challenging for Afghanistan. Continuous war and insecurity left a fragile governance system in Afghanistan. Lack of human capacity in terms of policy making and strategic planning and weak economy in one hand and the limited hydro-meteorological data and technical knowledge about Water management on the other hand, alienated Afghanistan from all cooperative frameworks on Amu Darya River and two other its major river basins. In this paper, the initiatives and plans which have been implemented by the Afghan Government and international community for enhancing human capacity and hydro-meteorological data acquisition for developing a suitable mechanism for managing transboundary waters for the purpose of economic growth of Afghanistan and regional cooperation on transboundary water between Afghanistan and riparian countries have been analyzed. However, several challenges still exit in terms of water management in Afghanistan to be tackled in. The challenges which Afghanistan has been experiencing in last forty years in water governance sector based on academic and policy literatures being reviewed and some solutions for overcoming the challenges are provided. In conclusion, steps and measures which further needed to be put forward by the Afghan government and international community to reach a regional cooperation framework on transboundary waters between Afghanistan and other riparian countries are proposed.

Keywords: Transboundary waters, water governance, regional cooperation, economic development, strategic planning

Paper type: Opinion paper

1. Introduction

Afghanistan has many water resources and its geography provides significant opportunities for their exploitation (King & Sturtewagen 2010). Climate change, glaciers retreating and demands for exploitation water resources for economic development and poverty reduction

are the reasons for intensifying concerns over transboundary water governance within the country and in the region. Water resources flowing through Afghanistan are relatively abundant. At more than 2,700 m3/ capita/year, the surface water availability is 60 percent above the threshold necessary for a country to have, in theory, sufficient water to meet its domestic, agricultural, energy, industrial and environmental needs (Thomas et al. 2016). But insufficient infrastructure and a lack of capacity, however, limit Afghanistan's ability to store, properly manage, and develop its water resources. Ninety percent of Afghanistan's irrigation today is managed through traditional, community-based Mirab schemes, which are independent of broader national or regional arrangements and limited in their efficiency (King & Sturtewagen 2010; Thomas & Ahmad 2009).

Since the collapse of the Taliban regime, the government of the Islamic Republic of Afghanistan (GIRoA) has been actively trying to resume its "hydraulic mission" (Molle el at. 2009), which was suspended in the late 1970s. Improving water control was defined as the new development priority by the GIRoA. Four decades of war and unrest have dramatically diminished Afghanistan's water infrastructure and decimated its human capacity in hydrology. Only 1.5 million hectares of agricultural land were irrigated in 2002 (an additional 300,000 hectares have been rehabilitated since), less than half the area irrigated in 1979. Irrigation schemes are less reliable than in the past. Heavily dependent on seasonal rain and snowfall, Afghanistan's water resources have become unstable. Glacial retreat and early snowmelt have severe effects on seasonal water availability (Thomas & Ahmad 2009).

In addition, another challenges or drawback water resources distribution over the country or in other word, Afghanistan's water resources are unequally distributed. The Amu Darya Basin, including the Harirud and Murghab Basin and non-drainage areas, covers about 37 percent of Afghanistan's territory but contains about 60 percent of the water flow. The Helmand Basin covers about 49 percent of the territory and holds only 11 percent of water flow. The Kabul–Eastern River Basin, with area coverage of about 12 percent, holds around 26 percent of the water flow (King & Sturtewagen 2010).

Furthermore, Agriculture has traditionally dominated Afghanistan's economy and contributed for a large part to its growth. About 70 percent of Afghans live and work in rural areas, mostly on farms, and 61 percent of all households derive income from agriculture. The country needs new dams to increase storage capacity and improve irrigation efficiency to balance these seasonal shifts. Currently Afghanistan has the lowest storage capacity per capita in the region (King & Sturtewagen 2010). As once President Ghani said: "Water is another major resource for Afghanistan. The government will develop a legal foundation to better capitalize on this resource. We are already investing in dams and irrigation infrastructure to raise agricultural productivity, and as technical designs are completed we will be accelerating investment in this sector that is a key for both growth and poverty reduction." (ARG 2017)

It is vital for Afghanistan government to develop and manage its water resources to reach its developmental goals in energy, agriculture, rural and urban sectors. Indeed, because it is a late developer, Afghanistan's legitimate development projects will almost inevitably have an impact on neighbors who themselves are already in a state of over-exploitation of their water

resources (Thomas et al. 2016). The aim of this paper is to study and analysis all the law and regulations of Afghan government in water governance sector and how what kind of solutions are suitable for managing Afghanistan's transboundary waters effectively, efficiently while considering trust and engagement of all stockholders. In this paper, first of all, brief information about all five main river basins in Afghanistan is provided. Then, Afghanistan's recent development from 2001 to 2017 in terms of transboundary water governance and initiatives, and external and internal challenges which has been facing for implementing water related strategies and projects are discussed. After, describing all the measures and initiatives by the Afghanistan government, challenges and solutions for resolving the challenges are explained. In conclusion, based on literatures reviewed and the research conducted by the author himself some recommendations are provided.

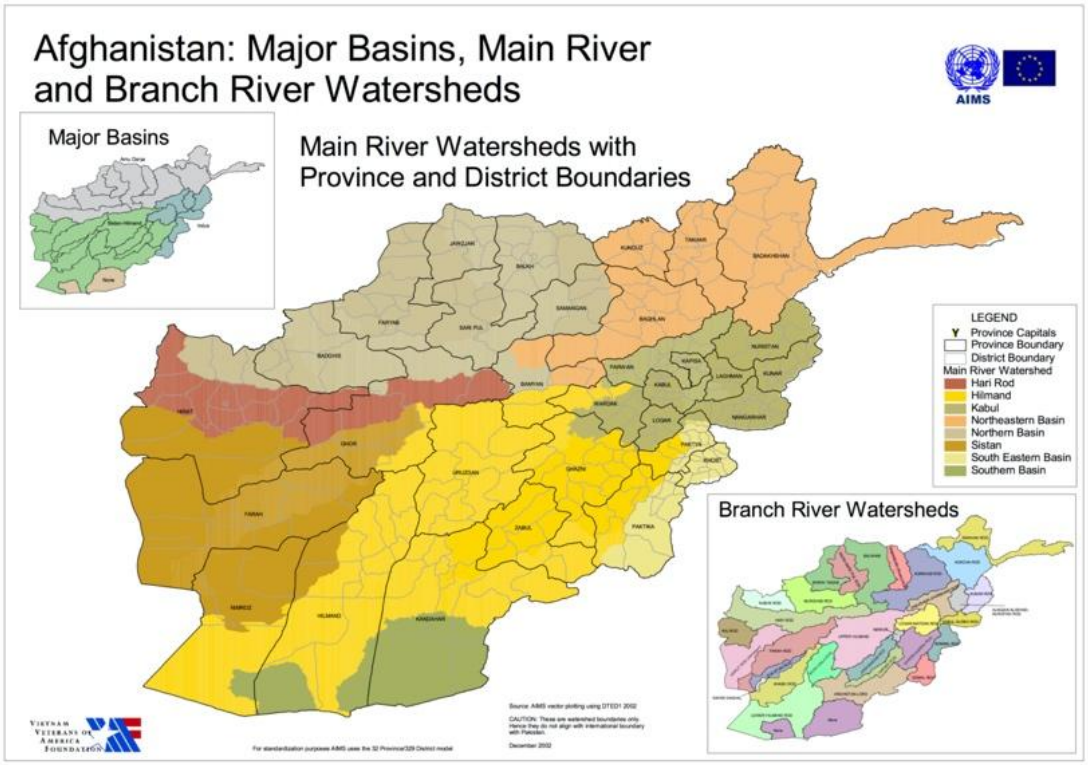

Figure 1. Map of Main River and Branch River Watersheds of Afghanistan, source: Afghanistan Waters Portal http://afghanwaters.net/en/tag/map-main-river-and-branch-river-watersheds-of-afghanistan/.

2. The Amu Darya Basin

The Amu Darya or Oxus in Greek and Jayhoon in Arbaic is one of the longest rivers in Central Asia and an essential part of the Aral Sea Basin. It flows west- northwest into the Aral Sea. It forms part of Afghanistan's borders with Tajikistan, Uzbekistan, and Turkmenistan and part of Uzbekistan's border with Turkmenistan. The water resources of the Amu Darya Basin are shared between Afghanistan and all the Central Asian states. Iran also shares in the wider

Amu Darya Basin if one includes the Harirud, also known as the Tejen River, which Iran shares with Afghanistan and Turkmenistan. This basin has a catchment area of 90, 692 km2 within Afghanistan, it covers 14% of the Afghan Population and irrigates 23% of the total agricultural lands. Its annual discharge is estimated at about 20.70 billion cubic meters from Afghanistan side (Duran Research and Analysis 2015; King & Sturtewagen 2010).

Livelihood of more 43 million people in the Aral Sea Basin is depended to the Amu Darya. The Amu Darya is crucial for development of agriculture in all riparian countries and for hydroelectric power in upstream countries (Tajikistan and Afghanistan). In the last decades water resources being used inefficiently and now with the burden of climate change, glaciers are retreating have reduced the level of flow in the Amu Darya. As water in the Amu Darya decreases, the claims on groundwater reserves in the basin constitute a growing cross-border challenge (King & Sturtewagen 2010). Thus, it is vital for riparian countries to take constructive actions and use water efficiently in the context regional cooperation and agreement.

3. The Harirud – Murghab River Basin

The Harirud-Murghab River Basin represents approximately 12 percent of Afghanistan's water resources and is centered on the intensely irrigated area of Heart with an annual flow of about 3.06 billion cubic meters. It has a catchment area of 77.604 km2 and it covers 8% of Afghanistan population and 11% of the total agricultural lands (Duran Research and Analysis 2015). It rises in the central Hazarajat and flows west through north-east Iran before exhausting itself in Turkmenistan. The Murghab River rises in the Hindu Kush range, which separates it from the Harirud Basin, and flows north into Turkmenistan. The Harirud originates in the Koh-I-Baba Mountains and flows west, forming the border with Iran and later between Iran and Turkmenistan before ending in the Qaraqum Desert in Turkmenistan. The Murghab flows from Afghanistan directly into the Qaraqum desert in Turkmenistan. The Western Harirud and Murghab basins form part of the wider Amu Darya Basin (Duran Research and Analysis 2015).

4. The Helmand River Basin

The Helmand River is the longest river basins of Afghanistan (Yildiz 2017) at approximately 1,300 kilometers long located in the southern part of the country. It rises in the Hindu Kush Mountain range about forty kilometers west of Kabul, north of the Unai Pass, and has five tributaries. It covers 41% of the total Afghan river basin area and it makes 31% of Agricultural lands in Afghanistan with as estimated annual flow of 9.30 billion cubic meters (Duran Research and Analysis 2015). While crossing southwest through the desert of Dashti Margo, it forms the Afghan-Iranian border for fifty-five kilometers before flowing into the Sistan marshes and the Lake Hamun region around Zabol. The water resources of the Helmand River Basin are used extensively for irrigation, though an increase of mineral salts

has decreased its utility for irrigation. The Helmand River Basin's water is crucial for Afghan and Iranian farmers in Sistan and Baluchistan alike.

The Helmand River, shared between Afghanistan and Iran, is the only river basin on which Afghanistan has entered into a formal agreement with a neighbor (Thomas & Warner 2015). It presents an interesting case from which to draw lessons for potential cooperation on other trans-boundary water resources across the region with other neighbors like Pakistan and Central Asian countries.

5. The Kabul-Indus River Basin

The Kabul River flows in eastern Afghanistan and northwestern Pakistan. It is approximately 700 kilometers long, of which 560 kilometers (350 miles) flow through Afghanistan. Rising in the Sanglakh Range 72 kilometers (45 miles) west of Kabul city, it flows east past Kabul and Jalalabad, north of the Khyber Pass into Pakistan, and past Peshawar. It joins the Indus River northwest of Islamabad. It makes 35% of Afghanistan Population and 20% of Agricultural lands within Afghanistan (Duran Research and Analysis 2015).

The Kabul River Basin, including the important tributary Kunar River, represents approximately 12 percent of the available water resources in Afghanistan. It is crucial to the livelihoods of the millions of people sharing its water resources for drinking water, sanitation, agriculture, power generation, and industry. A major tributary of the Indus River, the Kabul River traverses Kabul and crosses the eastern border into Pakistan. Kabul River is the sole source of drinking water for almost 7 million people in both Afghanistan and Pakistan and comprises one-fourth of Afghanistan's freshwater. The waterway is a vital source of life and livelihood for the nearly 25 million people who live in the basin (USAID Afghanistan 2018).

6. Measures taken by Afghanistan government in transboundary waters governance

In general, Afghanistan has had many water management initiatives since 2001 a) including water in Afghanistan National Development Strategy (ANDS) (Afghanistan National Development Strategy Secretariat 2008), b) Creating Afghanistan Water law and c) Water Sector Strategy (WSS). Most progress has been made in the area of transboundary water waters over the years under the current National Solidarity Government of Afghanistan. Although the mandate has advanced in this area based on the work of the previous Karzai administration, the transparency and commitment of the current administration to deal with transboundary water issues with neighboring countries has prompted a fair and pre-eminent debate in the region. Transboundary waters are counted as platform for regional cooperation (Qaddumi 2008) and several transregional economic projects are under implementation between Afghanistan, central Asian Countries, India, and Pakistan.

In addition, agriculture plays an important role in Afghanistan's economy and the constraints water scarcity and dilapidated water systems impose on expansion of agricultural development, it is not surprising that rehabilitation of the water sector is one of Afghanistan's "major national priorities." The 2008 Water Sector Strategy approved by the Ministry of

Energy and Water and other responsible ministries explicitly links development of the water sector with agricultural development and the fight against poverty, particularly in rural areas. The government has recognized that "rehabilitation of irrigation networks has a quick impact on farmers, while new irrigation network development has a large impact on rural areas by expanding irrigated land. Therefore, both the rehabilitation and new development of irrigation networks are urgently needed to convey water from resources to irrigation fields, and to expand irrigation fields for more stable crop harvesting even in drought years." More irrigation lands require more water and building new canals and dams cause water diversion therefore, it can become a great concern in downstream countries and will more destabilize the region (Thomas et al. 2016).

6.1. Legal bases in water sector

The Preamble to Afghanistan's Constitution broadly states that its goal is to achieve a "prosperous life and sound living environment" for all citizens. Article 9 reflects the importance of sound management of natural resources, including water. It states that the "[p]rotection, management and proper utilization of public properties as well as national resources shall be regulated by law." A similar obligation to protect natural resources is contained in Article 15, which requires the government to "adopt necessary measures to "improve forests as well as the living environment."

The constitution further obliges the government, "within its financial means," to "design and implement effective programs to develop agriculture and animal husbandry." It identifies agricultural as a means of improving the "economic, social, and living conditions" of farmers, herders, and other citizens.

The Civil Code provides that water from rivers and their tributaries are "public property." Everyone, however, has the right to use water to irrigate or draw on a stream for irrigation of private lands, including for irrigation of crops and trees, so long as the usage is not "contrary to public interests or special laws." The Civil Code does not clarify what types of uses are or are not "contrary to public interests," except noting that the "usage of water from public streams and its distribution shall be exercised with due observation of prevention of harm to public interests and proportionate to the lands that it is intended to be irrigated."

The Water Law was adopted to enforce the protections afforded by Constitution Article 9 through regulations aimed at promoting "conservation, equitable distribution, and the efficient and sustainable use of water resources." The law is intended to strengthen the national economy and secure the rights of water users in a manner consistent with the principles of Islamic law and the "praiseworthy customs and traditions of the people."

Like the Constitution and Civil Code, the Water Law provides that water "belongs to the public" and "people of Afghanistan." Water may be used "with due consideration for the praiseworthy customs and traditions of the people to meet the needs for drinking water, livelihood, agriculture, industry, public services, energy production, transportation, navigation, fisheries and the environment." Of these varied uses, the law gives priority other use of water for "drinking" and "livelihood." The use of water shall be free. Service providers,

however, may charge fees for "supplying, storage, transmission, diversion, treatment, and operation and maintenance of the water supply and irrigation systems and other related activities. . . ." A water user who does not pay the required fees to a service provider or who misuses the water services may have his right to use water suspended. The government is obliged to protect and manage water as a natural resource. Afghanistan's Water Law identifies 11 different ministries or departments with responsibilities over specific aspects of water protection, control, and management. Overall coordination for water resource management is intended to be provided by the Supreme Council of Water Affairs Management whose members are appointed by the President.

Afghanistan Water Law adopts an integrated water resources management approach based on a transition towards river basin development and a strong role for local stakeholder participation. The Water Sector Strategy, for instance, stressed the need for "end user" participation in decision making relating to water resource management, operation, and maintenance of water supply systems, as well as allocations of water use. Likewise, the Water Law encourages stakeholder involvement in overall water resource planning and management, recognizing that this involvement is particularly important at the local level (UNAMA 2015).

To this end, the Water Law establishes river basin agencies and councils to promote the involvement and participation of local water users and other relevant stakeholders in the decision-making process. These river basin councils are meant to be established in each of Afghanistan's five river basins identified in the map below.

Among other things, the river basin councils have the following responsibilities in their respective basins:

- determining water allocations in accordance with national water policy;
- managing and monitoring the right to use water;
- establishing criteria to evaluate, adjust, and deny water use permits;
- issuing, modifying, and canceling water use permits;
- supervising activities and reviewing decisions of sub-basin councils; and
- resolving disputes that arise due to the distribution and use of water.

In addition to the river basin agencies and councils, the Water Law requires the Ministry of Energy and Water to establish sub-basin councils composed of members representing local "water users, relevant government institutions, and other relevant stakeholders." The sub-basin councils have similar dispute resolution powers as water basin councils but no authority to issue or modify water use permits. As already noted, the decisions and activities of the sub-basin councils are subject to review and supervision by the relevant water basin council.

In keeping with the integrated approach to water resource management, the Water Law anticipates that local water user associations will play a key role in protecting and managing water resources. The law establishes two different associations: water user associations and irrigation associations. Article 10(12) requires the Ministry of Energy and Water to establish water user associations, which are voluntary assemblies of "real and legal persons" who meet

to consider the "social, economic and vocational use of water" within their communities.98 Article 11(5) charges the Ministry of Agriculture, Irrigation, and Livestock with establishing irrigation associations. The role of irrigation associations is detailed in Article 23, which states that the Ministry of Agriculture, Irrigation, and Livestock can delegate responsibility for the distribution of water within the irrigation networks (i.e., canals) in designated areas to registered irrigation associations. Article 23 links these irrigation associations with the traditional management of irrigation systems by allowing irrigation associations to delegate management and responsibility of water rights to a Mirab-bashi or Mirab designated by the association (Ahmadzai et al. 2017).

6.2. In policy, organizational and capacity building sectors

Based on Afghanistan Water Law which was adopted in 2009, management and planning for the transboundary waters between Afghanistan and its neighboring countries and changes of watercourses are the responsibility of the Ministry of Energy and Water with agreements from the Ministry of Foreign Affairs, Ministry of Interior and the Ministry of Border and Tribal Affairs (Article 8(9)).

The Afghanistan transboundary waters policy framework which is prepared by the Afghan government is very important document for guiding the government to solve its transboundary issues with its neighbor. In this policy framework on equitable and reasonable use and not significant harm of water by riparian countries concentrated. And it is understood that comprehensive cooperation in technical and scientific sectors between different institutions can contribute to data sharing, human capacity development and implementation of joint transboundary projects.

Transboundary waters policy framework will help to reach following goals: Ensure the demand for the allocation and use of transboundary waters for its economic growth; Establish and develop a framework for the expansion of cooperation with the riparian countries on the basis of goodwill, mutual benefit and mutual action, taking into account the national interest; taking measures to reduce the possible harm to riparian countries; and a platform of negotiation and dialogue for reaching bilateral and multilateral regional agreements on transboundary waters.

Major institutional reforms in last years, the Transboundary Water Commission and High councils of Land and Water have been established under the authority of the President and the Transboundary Water Management Unit at the Ministry of Energy and Water. Since water is a subject of great interest, it affects different sectors. Various institutions in Afghanistan are responsible for protecting and managing water resources in cooperation with ministry of Energy and Water.

6.2.1. Afghanistan Transboundary Waters Commission

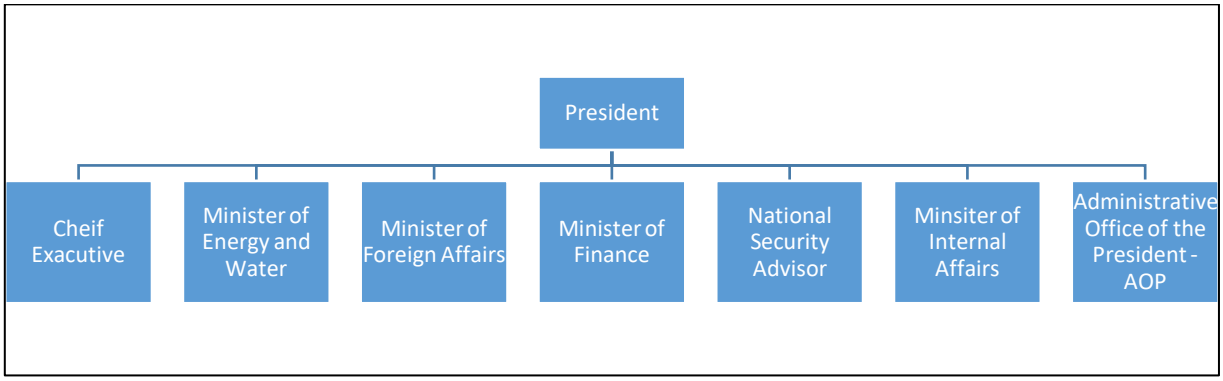

Figure 1. Afghanistan transboundary waters Commission.

Each of these ministries has assigned a number of technical staff to work on issues of transboundary water. Furthermore, the Ministry of Energy and Water has established a technical unit for transboundary water management, the Ministry of Finance has also assigned a number of technical staffs to this field, and the Ministry of Foreign Affair's Department of State for Border and Collaboration Affairs are also part of this structure.

In addition to these units in the ministries, there is an inter-ministerial committee that brings together all the interconnected ministries of transboundary water issues for the sake of coordination and coherence among them at the technical level. In addition to these, changes have been made to the Supreme Council for Land and Water. As the land plot was added to the council in 2015, and in particular, this council is currently under the leadership of the president, which is indicative of the importance of land and water issues in the country. But the most important development in the transboundary waters is the drafting and approval of the first national policy of transboundary water by the Afghan government in 2016. The prospect of this policy is to work with neighboring countries to address the issues of transboundary water.

Furthermore, in human capital development, the government has launched efforts to build capacity in the field of knowledge of transboundary water resources. International donors such as the World Bank and the EU have provided education and knowledge development in key ministries (Duran Research and Analysis 2015).

6.2.2. High Council of Land and Water

For the purpose of properly managing state-owned land and providing effective services in this regard, Afghanistan's Directorate of Land proposed the establishment of High Council on Land and Water to Presidential Palace of the Islamic Republic of Afghanistan on the grounds of its five-year strategy. The creation of the Council was approved on 08 April 2015 upon release of Administrative Order No. 3 in line with Article 63 of the Constitution (ARG 2015). The Council was created for a series of purposes such as approval of reforms and policies related to land and water affairs as well as full and effective implementation, supporting and

overseeing of those policies. The Council is also charged with fostering cooperation among government, private and donor institutions. Finally, the Council is responsible for resolving issues related to usurped private and government property and the design and implementation of large national projects in this respect.

Objectives of High Council on Land and Water:

- To approve policies pertaining to reforms of affairs related to farming and water as well as supervising and supporting the effective implementation of those policies
- To initiate cooperation among government institutions, private sector and donor entities in the sector of farming and water
- To address main issues and retake usurped private and government land
- To facilitate mapping out and implementation of large national projects

6.3. In regional agreements and cooperation sector

There is no institutionalized framework of cooperation on Afghanistan all four transboundary basins with the exception of the 1950, then the 1973 bilateral treaty between Afghanistan and Iran on the Helmand River. Factors that have hampered bilateral, multilateral, and regional cooperation efforts are complex and include the power asymmetry between Afghanistan and its neighbors, decades of instability in Afghanistan and disputes over border line (Gharji 2012) between countries (Afghanistan and Pakistan) which has crystalized and endangered bilateral cooperation between the two nations.

Several existing processes have shown the potential for bilateral—if not regional—cooperation on water. The Iran-Afghanistan dialogue on the Helmand River is the most developed. Additionally, recent agreements in the framework of ECO (Economic Cooperation Organization), RECCA (Regional Economic Cooperation on Afghanistan), and other forums could start to serve as a fertile ground for bilateral and regional water diplomacy. The 2013 agreement between Afghanistan and Pakistan's Ministry of Finance on the search for ways to expand the Kunar River in order to meet the common interests of the two countries in the field of hydroelectricity (Thomas et al. 2016) which is primarily steps for bilateral cooperation on Kabul River Basin, the basin which still missing a formal platform for cooperation.

Regional cooperation requires political will, which, to date, has not been forthcoming. Instead, mistrust and political considerations focusing on what is perceived as national interest have hampered the potential for forward- looking cooperation in the region. This issue is very hot and sensitive in case of Kabul River basin because Afghanistan have always expressed its concerns regarding granting save havens to Taliban and other terrorist groups by Pakistan military. Reframing the narrowly defined perceptions of national water security, reversing stereotypes surrounding water, creating political will, and increasing people’s participation in water issues is urgent.

6.3.1. Agreements on Amu Darya

Afghanistan is the second-largest contributor of water resources to the Amu Darya after Tajikistan, so there is an obvious need for cooperation between Afghanistan and the Central

Asian states. Yet Central Asian states have had limited engagement with Afghanistan, in part because of differences among Central Asian states themselves and instability in Afghanistan. Recently, Memorandum of Understanding of 2010 and 2014 on cooperation on the development and management of water resources of the Amu basin in Tajikistan, including the exchange of data and information which is support by the UNECE.

Since 1873, Afghanistan and its northern neighbors— Russia, the Soviet Union, and the Central Asian states— have concluded agreements relating to the Amu Darya. These agreements focused solely on the river as an inter- national boundary. No water resource sharing schemes were ever stipulated. The most significant agreements:

- The Frontier Agreement between Afghanistan and Russia (1873);
- The Frontier Agreement between Afghanistan and the Union of Soviet Socialist Republics (1946);
- And, the treaty between the government of the U.S.S.R. and the Royal Government of Afghanistan concerning the regime of the Soviet-Afghan state frontier (1958).

Following the dissolution of the Soviet Union, the newly independent Central Asian states established a number of institutions for regional cooperation on water without involving Afghanistan, which were later all integrated into the International Fund for Saving the Aral Sea, including:

- The Interstate Coordinating Water Commission (ICWC)
- The subordinate Amu Darya and Syr Darya Basin Management Authorities
- The Interstate Council on the Problems of the Aral Sea Basin (ICAS)
- The International Fund for Saving the Aral Sea (IFAS).

The 1997 integration of ICWC and ICAS into IFAS indicated the member states' awareness of the gravity of the Aral Sea environmental crisis and the need to more effectively coordinate their response (Peachey 2014). Through their regional water cooperation frameworks, Central Asian states have agreed to adhere to international water law. The inherent commitment to equitable, reasonable, and mutually advantageous water resource use would imply recognition of Afghanistan's interests in the Amu Darya, but to date there have been no credible moves to integrate Afghanistan into IFAS structure.

6.3.2. Agreements with Iran

On September 7, 1950, the Afghan and Iranian governments signed an agreement establishing the Helmand River Delta Commission to elaborate technical methods to share the Helmand River's water between Iran and Afghanistan. The commission was to provide an engineering basis for mutual accord regarding the apportionment of the waters of the Helmand. It was composed of three engineers from states with no vested interests in the area and with nonbinding powers of recommendation. Iran and Afghanistan did not agree with the commission's 1951 report (Duran Research and Analysis 2015).

However, in 1973, Iran and Afghanistan signed a bilateral treaty on the allocation of the Helmand River's water resources. The agreement allocates twenty-six cubic meters per second to downstream Iran. Due to the 1973 Afghan coup, the 1978–79 revolution in Iran, the 1979 Soviet invasion of Afghanistan, and the rise and fall of the Taliban, the treaty was never fully implemented and disputes over the terms of agreement remained. Improved Kabul-Tehran relations following the ouster of the Taliban have not yet yielded a solution. The absolute character of the stipulated allocation, as opposed to a percentage basis, appears to be the key flaw in the agreement as it stands.

Nevertheless, constructive moves to solve outstanding disagreements have taken place in recent years. Afghanistan and Iran have assigned a common Helmand River Commissioners Delegation in accordance with Protocol 1 of the Helmand River Treaty. The Afghan and Iranian Helmand River commissioners currently meet on a quarterly basis to promote bilateral cooperation and the formation of subcommittees on dredging and flood control in the Helmand. In addition, in 2013, the government signed a memorandum of understanding (Afghanistan analysts network, 2013) with Iran by taking another step. The memorandum, along with addressing issues such as trade, transport and security, is about the importance of addressing the benefits of water.

7. Challenges of water governance in Afghanistan

Despite reforms and development in water law and water sector strategy adoption, still the Afghan government faces two kind of internal and external challenges which has deal with. Internal challenges are divided in two parts one is institutional malfunctioning and other one is in technical sector. Institutional dysfunction as stated by (Acemoglu & Robinson 2008) has caused low economic grows, inadequate governance systems in national and local levels, lack of human capacity, poor coordination between responsible ministries and organizations, and lack of civil society and public-private partnership in water sector and particularly, in transboundary water management.

First, effective economic mechanism contributes to the growth of the national economy via effective services for efficient water use in all sectors but lack of clear economic strategies in order to attract investments in water supply and hydropower generation is still on the ground and it undermines the economic growths. In addition, activities in water sector is apart from larger context like environmental degradation and climate change, poverty reduction, population control, revenue generation and employment creation, urbanization and refugee repatriation. There are clear linkages between water and land, their effects on each other and the role they together play in climate change. Population growth, in the next 2-3 decades, in particular in urban areas and as a result of refugee repatriation is going to heavily add to the already existing high demand for water, requiring increased system efficiency and capacity for adaptability.

Second, the Water Law of 2009, though now in place, is the only national legal document regulating the water sector. It places almost no emphasis on trans-boundary waters, however.

The Government's major policy documents, such as the Strategic Policy Framework for the Water Sector, ANDS, and the Water Sector Strategy, inadequately address the issue of trans-boundary waters. Though the ANDS Monitoring and Evaluation Framework required semi-annual reporting on improved water sector governance frameworks and institutions, progress in this area has been rather slow. Currently, the Ministry of Foreign Affairs is reviewing a draft of Trans-boundary Waters Policy prepared by the Ministry of Energy and Water.

Third, there is a multiplicity of institutions with a mandate on water, leading to complicated planning processes due to unclear delineation of responsibilities between ministries. Despite the establishment of the Supreme Council of Water (SCoW), coordination among water-related institutions and agencies remains weak. A major feature of this lack of coordination is the absence of integrated platform for communication, information sharing and exchange of ideas between organizations. This however, should not undermine the technical progress that the Technical Secretariat of the SCoW has made since its establishment.

Fourth, civil society, Afghan media, academia, and the Afghan private sector are excluded from discussions about the development and management of transboundary waters, and their existing capabilities have remained untapped. Attempts to create regional bridges between civil society between riparian states and with a view to developing a common understanding of a number of common problems related to water is still very poor.

Regarding to external challenges of transboundary water governance in Afghanistan, Many of Afghanistan’s security challenges are cross-border and regional in nature and require a regional approach that is supported by international actors (Yildiz 2017). There is an apparent need for regional cooperation on water to help Afghanistan exploit a reasonable and equitable share of water without significant harm to downstream riparian states. However, without due attention to existing cross-border challenges between Afghanistan and its neighbors, a regional approach could complicate already difficult issues (Safi & Alizada 2019; King & Sturtewagen 2010). It would appear, there- fore, that dialogues specific to river basins should be a constitutive element of a wider regional approach. NGOs and Local engagement (OECD, 2015) is indispensable in such dialogues, both in the assessment of needs and in the implementation of proposals.

First, gaps in data and human capacity has kept Afghanistan away from international conventions and treaties related to transboundary water governance. Non-compliance with conventions and bilateral or regional framework (Koyano 2008) will have adverse effects on Afghanistan role which it can play in regional dialogue. Afghanistan is not currently a party to any of the conventions on international watercourses. Despite the obvious interdependence, there are limited bilateral agreements on water resources and there is no regional framework for cooperation. The spirit of competition is largely maintained, in contrast to cooperation, which indicates a lack of an internal understanding of the general nature of problems in this sector. Thus, regional negotiations without compliance to international watercourse conventions will arrive to the deadlock.

Second, lack of strategic coordination of international funds for long-term projects is another deficit. The attention of the donor community to emergency projects and short-term tactical

initiatives to build individual capacity has contributed to the search for projects and funds in government ministries without proper long-term programmatic integration. In addition, with the exception of a few cases, the work of most international organizations in the water sector is not conducted in a coordinated manner, with virtually no minimum knowledge of the areas of activity of other international organizations.

Besides external challenges, Afghanistan is facing technical challenges which have huge contribution to the poor governance of water in Afghanistan. Here, some of the main challenges in technical sector are highlighted.

First, lack of hydrological, meteorological, geotechnical, and water quality data cause huge uncertainty while dealing transboundary waters. From the Soviet invasion to 2005 water stations either did not operate, decommissioned or destroyed. Though since 2006, 125 hydrological (out of a target of 174 as per the ANDS) and 56 meteorological water stations have been installed, the Afghan government, like the governments of the neighboring riparian countries, is guarding this information as data vital to national security (Duran Research and Analysis 2015). In any case, there is lack of long-term data of at least 30 years, a pre-requisite for appropriate water-resource planning and development. Lack of hydrological, meteorological, geo-technical and water data remains a serious challenge, impeding Afghanistan's capacity to engage in regional dialogues.

Second, inadequate infrastructure is an obvious problem, mainly caused by a lack of resources and decades of conflict. Proper infrastructure and equipment are necessary for the effective conservation and use of water resources (McKinney 2003) resulting from seasonal runoff and snow melt. Progress on this front was insufficient, despite the fact that the focus of the Water Sector Strategy on the construction of reservoirs and the protection of groundwater are being made.

Third, in terms of groundwater utilization, insufficient investments in groundwater recharge potential (Sharma, 2009) is what causing most of the damage to the depletion groundwater. Hydrogeological investments in increasing the possibilities of groundwater recharge very poor. Awareness of the concept of water conservation in rural and urban areas is very small. Access to clean drinking water is a component of the main development activities of most stakeholders, which are solved by digging thousands of deep wells in villages without due consideration for the long-term impact of this practice on water production and the preservation of groundwater. There is a widespread belief that groundwater is being extracted at a rather dangerous rate.

Fourth, cities including Kabul, the capital city of Afghanistan are missing proper urban waste water management. Urbanization is a new problem not only in Afghanistan, but throughout the region. Given the current population growth rates in Afghanistan and neighboring countries, urban water management systems are not ready to adapt to rapidly changing lifestyles (Koop & van Leeuwen 2016), which leads to increased reliance on temporary solutions with adverse long-term consequences, such as excessive reliance on groundwater production. The lack of a groundwater policy that focuses on monitoring groundwater recharge.

8. Solutions

With a relative abundance of water, significant mineral resources, and large agricultural capacity, Afghanistan is well placed to maximize its potential for sustainable development. Afghanistan is an agriculture-dependent country, thus efficiency in water use and effect irrigational system is important to be developed. In addition, its strategic geographic position as a natural crossroads for the region positions the country well to provide trade links between Central Asia, the Middle East, South Asia, China, and others. As President Ghani said at 7th Conference of The Heart of Asia – Istanbul Process: "There is a world to win. The mineral wealth of Afghanistan is waiting development, our water resources are significant and our agricultural potential are immense. One of the richest countries on earth in terms of gift and endow by God is being inhabited by one of the poorest population on earth. And its regional cooperation that would lift us from poverty to prosperity. Foreign aid will not do it, it is we as leaders who can lift our people and what we ask for is WTO rules for all of us to trade freely, to interact freely and to benefit freely." (ARG, 2017).

Afghanistan lacks a cohesive cross-sectoral national economic vision, resulting in low resource absorption capacity and spending talent, though with the new government, there is hope this challenge will be addressed, and hopefully driven by the spirit that prioritizes the water sector. It is important that Afghan government develop a National Economic Development Vision and Prioritize the Water Sector. It is imperative for the Afghan government to elevate the water sector from a subsector to a main sector and to focus on water development in addition to continued focus on water management, anchoring Afghanistan in international trans-boundary regulations put forward through the 1997 UN Convention.

Roles and responsibilities in national and subnational level are overlapping and there is lack of coordination. While the Water Law of 2009 mandates several ministries granting them a stake in water resource development and management. Though the law gives a broad division of labor, the practice remains, for the most part uncoordinated and confused. Strengthening the Supreme Council of Water through systematic integration of sufficiently experienced water and economic development experts can help systemize decision-making and improve coordination.

Lack of knowledge and understanding of international law and conventions in water and environmental sectors in Afghanistan is evident (UNEP 2013), thus, there is a need for establishing and enhancing knowledge base on transboundary water management and regional cooperation on mutual benefit of shared water between riparian countries (Qaddumi 2008). Though some steps have been taken, there is space and need to do more. The ANDS had tasked MoEW, Ministries of Higher Education and Mines to develop curriculum on water resource management by end 2009. In line with this assignment, courses have been developed at Kabul University and Kabul Polytechnic University. These efforts must continue but in a more integrated manner. The Water Sector Strategy emphasized the need to merge scientific theory with empirical and practical knowledge. This requires special focus on the capacity of independent research organizations and think tanks, through strengthened research processes

and exchange programs with regional and international research organizations, focusing on trans-boundary water management and development. Another avenue worth exploring is a regional partnership for universities in watercourse states in the region, based on the existing examples.

Climate changes is another threat to Afghanistan's social, economic, security and environmental growths. Recent flooding several parts of the country indicated which left thousands of people without drinking water and shelter show lack of preparedness of governments to tackle natural hazard and climate consequences. Therefore, it is important for the government to address water issues in a broader context. There should be mitigation and adaption mechanism for different climate change seniors.

Current legal and policy context of Afghanistan does not solve the problem of the development and management of transboundary water resources sufficiently and effectively. There should be proper mechanisms and structures in managing water resources. Development of a policy for the development and management of transboundary waters should be strategic in nature, positive in approach and futuristic in orientation. Strengthening institutional capacity and creating conditions conducive to the exchange of information, the national discourse of civil society and regional geo-strategic discussions on cooperation, could be the building blocks for such a policy approach. In particular, the completion of a transboundary water policy project should be considered as a national priority, contributing to the pace and nature of subsequent efforts.

Water diplomacy and compliance with international convention which are a critical practice for promoting of dialogues between a broad spectrum of water users in order to gain agreements. Water diplomacy requires a variety of support functions to be effective (IUCN 2011). This involves providing legal and technical assistance. It means connecting water users across scales. It involves raising awareness and advocacy on water issues. And it means providing data and information at the right time to ensure agreements are kept. Therefore Afghanistan needs to invest in hydrological, meteorological, geotechnical, and water quality data in order to have clear image of available water within its territory and lead negotiation towards mutual interests and make a win-win deal with its neighbors which has shared water. In order to facilitate the rationalization of use by all relevant watercourse states, moving towards regional cooperation is a must.

Furthermore, improved regional cooperation has the potential to improve trade and facilitate economic development by connecting land-locked Afghanistan to energy-rich Central Asia and energy-deficient South Asia. Facilitating Afghanistan's entry into the Interstate Coordination Water Commission of Central Asia can be a useful step. As the transit country, this can earn Afghanistan valuable revenue, reduced trade impediments and lowered trade barriers harmonization of standards and regulations to enhance cross border initiatives, improved border management and security and regional customs cooperation at regional level.

Afghanistan has to seek alternative for regional connectivity. Promoting strategic economic projects will lead the region towards more prosperity. Fortunately, there several projects in power, Natural Gas and transport under realization which will definitely enhance regional

cooperation. CASA 1000 Power transmission through Afghanistan from Central Asia to South, TAPI pipeline which will delivers gas from Turkmenistan through Afghanistan to Pakistan and India, and in transportation sector the Chabahar port is being inaugurated which will be a corridor between Central Asian countries, Afghanistan, Iran, India and the gulf countries (Ahmadzaia & McKinnab 2018).

This necessitates tapping into and improving capacity of civil society, academia, research organizations, media (water journalism) and the Afghan private sector through engaging them in national and regional debates on trans-boundary water resource development and management .Luckily the development and endorsement of the Right to Information Law remains a key priority of the new government, which can be counted upon as one of the cornerstones of people's and their representative institutions participation in debates of national significance. Also, measures should be taken to strengthen government research capacities and encourage independent Afghan research and civil society organizations. Involving civil society, the media, academia and the private sector: sharing information and cooperation in capacity building on the technical aspects of transboundary water development and management can be an excellent starting point for regional or bilateral cooperation (Duran Research and Analysis 2015).

In addition, international technical and financial support to the water sector in Afghanistan, with an emphasis on the development and management of transboundary water resources, is a critical element of stability in Afghanistan and beyond, affecting the entire region. It should be formulated and the funds should be directed to the areas which is needed (King & Sturtewagen 2010).

Besides policy and legal sectors, some solutions regarding to technical sphere of transboundary water management are highlighted as follow: Frist, address the data gap, study the use of innovative technologies in the collection, analysis and presentation of hydrological and meteorological data, a process, which must be extensively supported by the international community as well, are vital to Afghanistan water management. A major intervention can be the development of a Resource Center on Trans-Boundary waters, facilitating online and offline access to information, knowledge and international, regional and national researches on the issue. Establishing institutional connections between Afghan and international academic institutions, leading to a highly educated cadre in water resource development, management, international water law and water diplomacy could be another practical and useful intervention.

As stated before, theoretically Afghanistan have enough water but it lacks capacity and resources in management and storage. There is a need to develop water infrastructures like dams and reservoirs which will be beneficial water distribution for irrigation, generating hydropower and more importantly flood protection. It is important to start from small dams where interests of other riparian countries are not endangered. In addition, by reaching an agreement with neighboring countries, the chance of joint operations and bilateral investment in water infrastructures will be very high. In this case, there is a need to equip the river measurement and monitoring systems, mechanisms for data sharing between upstream and

downstream countries. Furthermore, international community can help the regions in terms advices and funds.

There is need to improve the knowledge of people and cities and urban areas about the consequences of overusing of groundwater in the long run (OECD 2015).

Furthermore, scientific research which will study the adverse effects of unsustainable and harmful practices that facilitate access to water through digging wells in the absence of water conservation systems. In addition, there should specific plan for recharging groundwaters and time-series measurement system of groundwaters (Wonnacott et al. 2015) in cities and rural areas. Recently, there are some steps towards artificial recharging of groundwater in Afghanistan which are very important for increasing depleted groundwater resources. But this kind of activities are in a very small scale, it needs to be improved.

9. Conclusion

The analysis of legal documents, policy and academic literatures have revealed the main internal, external and technical challenges which Afghanistan has been facing since 1970s in transboundary water governance. There is an all-in need for Afghanistan's politicians, decision makers, scientists, engineers and ordinary citizen to understand the vital role of transboundary waters play in flourishing their economy and positioning them as major player for regional peace, and economic development.

It is obvious that Afghanistan have huge natural water resources, its exploitation is very pivotal for its economic prosperity. Hence, Afghanistan will need to build more dams and reservoirs for its need for energy and water for irrigation. Afghanistan has to consider the current economic and power asymmetry in the region while making plans and strategy for using its transboundary waters, because, currently Afghanistan is depended to neighboring countries for trade and transportation. Any kind of activity on transboundary waters will endanger the regional peace and stability. For now, Afghanistan should focus on international communities and donors' interests for developing capacities in terms of human and technical resource to be able to negotiate its transboundary waters for its benefits. Afghanistan has to use the international funds for creating a strategic plan for economic development which can place Afghanistan as a hub for connecting south Asia to central Asia.

Regional connectivity works and it will assist for regional cooperation on transboundary water management and joint water infrastructure projects between all riparian countries. In addition, lack of solid knowledge of international law and the ability to negotiate waters in regional forums has irritated Afghans policy makers to talk about sharing benefits of transboundary waters with neighbors. Furthermore, hydro-meteorological data and capacity are another drawback for the Afghan government to start negotiation on transboundary waters with riparian countries. Therefore, hydro meteorological data management, acquisition and analysis play a vital role for stepping in transboundary water agreement and cooperation with interested parties.

Therefore, Afghanistan is currently away from regional cooperation agreements on water fearing that they might lose in bilateral forums. Data acquisition and exchange could be a first vital step for the improvement of the cooperation with riparian states. But it seems that there is a long way for water cooperation between riparian states in the region .Building up cooperation on the nonpolitical, technical aspects of water is the most promising starting point for any eventual bilateral or regional framework of cooperation. Information sharing and building technical capacities would contribute to regional trust building and lay a foundation for regional cooperation on other policy issues as well.

Afghanistan by support of international donors and communities can invest a lot on capacity building in different sectors like educating Afghans in water diplomacy, data management, integrated water resources management which being supported by USAID and recently by World Bank at Kabul Polytechnic university in Afghanistan. This kind of programs and initiatives can level – up Afghanistan in regional level to make short and long term strategies to exploiting its transboundary waters for its citizens' benefits and easing the way for regional cooperation on shared waters between Afghanistan and neighboring countries.

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