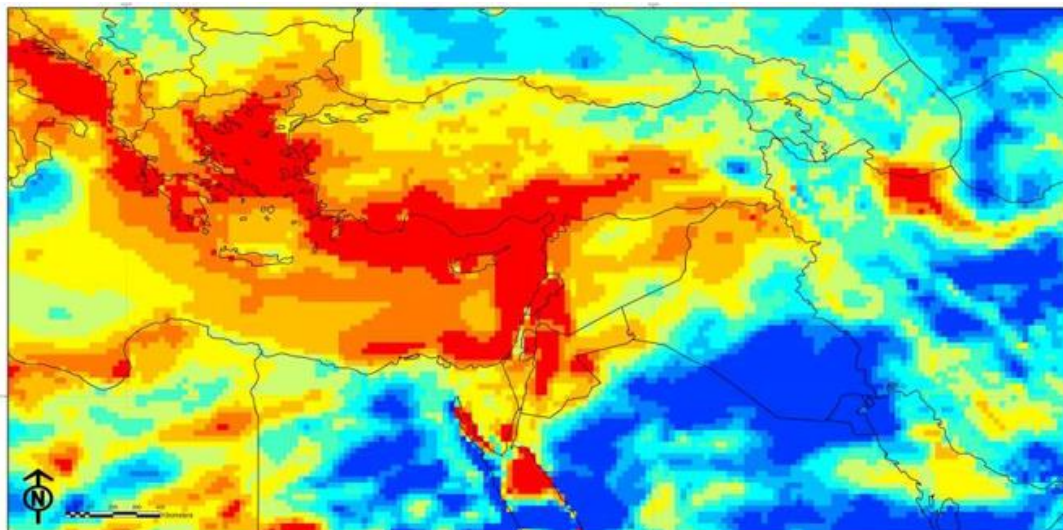


World Water Future

2019

Dursun YILDIZ
Hydropolitics Academy



percentage increase
-100 -20 -15 -10 -5 0 5 10 15 20 100

Percentage change in mean annual precipitation in 2040-2069 from 1961-1990 as simulated by PRECIS.



Contents

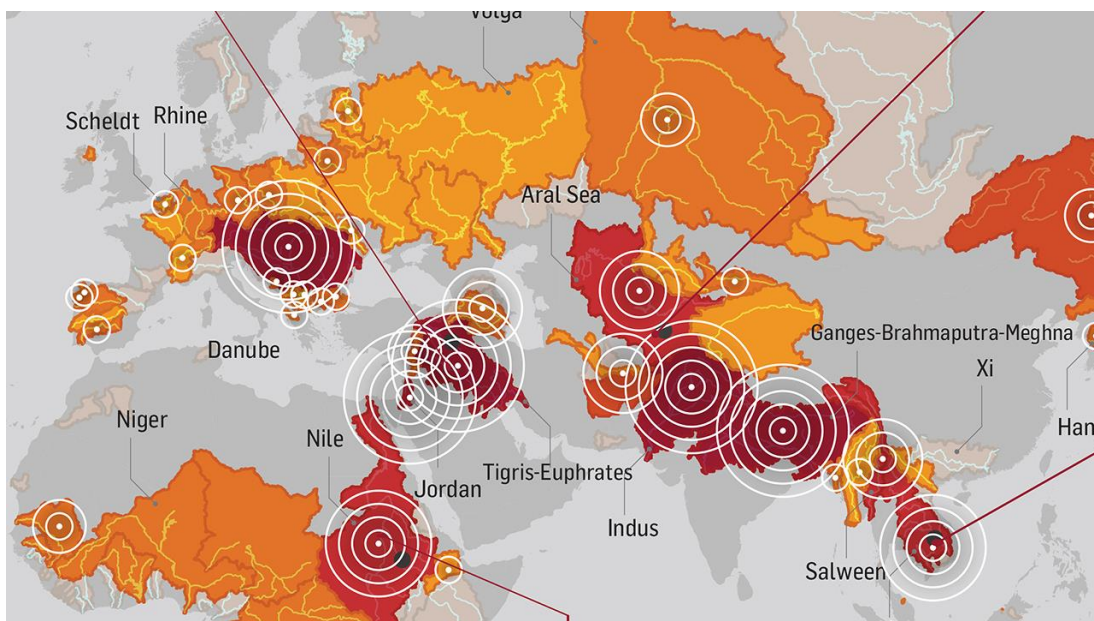
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By DURSUN YILDIZ



Hydropolitics Association

HPA



Conflicted Transboundary River Basins

Foreword



In transboundary river basins, we need to focus on creating mutually beneficial and integrated regional development projects

Unpredictable and unsustainable access to water is a rapidly growing problem and one of the world's greatest risks. We must learn to manage water more wisely, fairly and sustainably to avoid global crisis.

There are 310 transboundary river basins world-wide, home to 40 % of the global population. Establishing effective cooperation on the world's shared basins is vital for securing a peaceful, sustainable and equitable future.

Transboundary waters are a pivotal but underappreciated issue in global politics. Water management in many transboundary basins is highly politicized and has a considerable impact on conflict prevention, regional stability, environmental peace-making and international governance. Therefore, transboundary water governance is a domain that should elicit great interest in the foreign policy community.

As consequence, the use and allocation of water in transboundary basins is both a source of tension and an opportunity to promote cooperative practices and build collaborative institutions.

The extent to which these conflict risks can be managed and the significant cooperative opportunities that can be realized will depend on the level of political engagement demonstrated by both the basin countries and the international community.

We need to focus on creating mutually beneficial and integrated regional development projects

It is time to offer advice to the wider water community on how Water Diplomacy can be used as a trust building and conflict mitigation tool in support of broader regional cooperation and development.

One of the main points to focus is discussing how shared water resources could be an entry point for dialogue among riparian states.

We need to put innovative Hydro-Diplomacy into action. It requires paradigm shift from classical hydro diplomacy and try to focus on how to create;

- Shared Vision
- Shared Goal
- Unity of Effort among riparian states.

We need to focus on creating mutually beneficial and integrated regional development projects.

We can see innovative alternatives in sight if we are really willing to find them.

Best Regards,

Dursun Yıldız

Director

Hydropolitics Academy Center

2 January 2019

Afghanistan's Transboundary Rivers and Regional Security

ABSTRACT

Aside from the issue's peace and stability, one of Afghanistan's most vital needs is safe and reliable supplies of water. But Afghanistan faces certain economic, political, institutional problems to develop water resources potential. These problems will increase as the years go by.

Afghanistan is one of the world's poorest countries, with an economy largely based on subsistence agriculture. Afghan farmers depend on reliable, year-round sources of surface water and groundwater. Seasonal flows of streams and rivers fed by melting snowpack high in Afghanistan's mountains recharge alluvial aquifers located in populated valleys and provide city dwellers with drinking water.

The current population of Afghanistan is about 31 million and it is projected to increase by nearly 80 percent by the year 2050 to approximately 56 million. This will raise demand on the country's already economic stressed water resources.

Almost all of the river basins are transboundary in the country. The Country due to the political unrest has not participated in many of the agreements regulating water resources in Central Asia. its current "non-player" and "outsider" status of the Central Asian Hydropolitics has to be changed when starting water resources development. This could create an international dispute in future regional water sharing discussions.

In addition, recent research suggests that global climate change could alter precipitation patterns in Afghanistan. In particular, both the amount and the timing of snowfall received at higher elevations could change, impacting the major source of water for many areas in Afghanistan.

Development of Afghanistan's most transboundary water resources is a vital need for its own national interest, but it is also directly related with a transboundary water management dispute issue in the region. In other words, Afghanistan should find the best way to develop its transboundary water resources for national development as well as peace and stability of the region. But this development won't be so easy if current amount of water use of riparian states will be same when Afghanistan plans to release smaller amount of water.

Keywords: Afghanistan's Transboundary Rivers, Regional Water Security, Hydro Politics of Afghanistan, Central Asia's Water, Central Asian Hydropolitics



Photo 1. The Laghman River, one of Afghanistan's many waterways, is essential to agriculture and other development in this largely rural eastern province. Photo: UNAMA/Fardin Waez

1. INTRODUCTION

*Because of Afghanistan's innate land locked setting virtually all of Afghanistan's major rivers drain off into riparian neighboring states. Trans-boundary concerns are intensifying along all of Afghanistan borders....*¹

Afghanistan has many water resources and its geography provides significant opportunities for their exploitation.² Afghanistan possesses many rivers, river basins, lakes and desert areas. The four major river systems are the Amu Darya, the Oxus of antiquity, (boundary with Central Asia, 1,100 kilometers in Afghanistan); the Helmand (1,300 kilometers); the Harirod (650 kilometers in Afghanistan); and the Kabul (460 kilometers). Only the Kabul River, joining the Indus system in Pakistan, leads to the sea. Many rivers and streams simply empty into arid portions of the country, spending themselves through evaporation without replenishing the four major systems; others flow only seasonally.³

Afghanistan is an unlucky country that lacks the ability to develop its water resources. The existing water infrastructure has been destroyed during thirty years of war, this deficit in water management capacity exacts a heavy toll, exacerbating unemployment, food insecurity, water disputes, and the production of crops that can compete with illicit drugs. Without the means to store and divert water, existing infrastructure is vulnerable to

¹ Shojaudin, Ziaie, Islamic Republic of Afghanistan, Ministry of energy and water, "Water sector strategy for Afghanistan, National Development strategy" March 15 2007, p-9

² King, Matthwe, Sturtewagen, Benjamin, "Making the most of Afghanistan River Basins, opportunities for Regional cooperation". February 2010, p-1.

³ <http://countrystudies.us/afghanistan/33.htm>

devastating seasonal floods and droughts. Afghanistan also needs electricity, which only reaches 6 percent of its rural communities and 15 percent of its urban population.⁴



Figure 1. Afghanistan map and transboundary rivers

Afghanistan is highly susceptible to drought. When the country suffered a drought from 1999 to 2005, whole villages with limited water resources were forced to abandon their land and flee to larger cities and towns.

Improving the national and transboundary management of water resources of Afghanistan is a necessity to improve the lives of millions of people. Enhanced regional cooperation to avoid tension over the use and management of shared water resources will be crucial to the success of the Afghan government's and the international community's efforts to provide a secure and stable future for the country and its neighbors.

2. HYDROLOGY OF THE RIVER BASINS

Afghanistan divides hydrographically into four major river basins, **the Amu Darya, Hari Rud-Murghab, Helmand and the Kabul River Basin**, all of which cross international boundaries⁵

Additionally, Afghanistan's water resources are unequally distributed. The Amu Darya Basin, including the Hari Rud and Murghab Basin and non-drainage areas, covers about 37

⁴ <http://www.stimson.org/spotlight/transboundary-water-sharing-iran-and-afghanistan/>

⁵ Laura Schroeder, Therese Ure "River Basin Organization and Governance in Afghanistan" The XVth World Water Congress of the International Water Resources Association (IWRA) Edinburgh, Scotland, May 25-29, 2015.

percent of Afghanistan's territory but contains about 60% of the water flow. The Helmand Basin covers about 49% 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.⁶

The Amu Darya is one of the longest rivers in Central Asia. It flows into the Aral Sea and forms part of Afghanistan's borders with Tajikistan, Uzbekistan and Turkmenistan. Water resources from the Amu Darya are shared between Afghanistan and all of the Central Asian states through which it runs,

The Harirud-Murghab represents about 12% of Afghanistan's water resources. It is centered in Herat, an intensely irrigated region of Afghanistan. The river flows through Iran, ending in Turkmenistan, and acts as a border between Afghanistan and Iran and further between Iran and Turkmenistan.

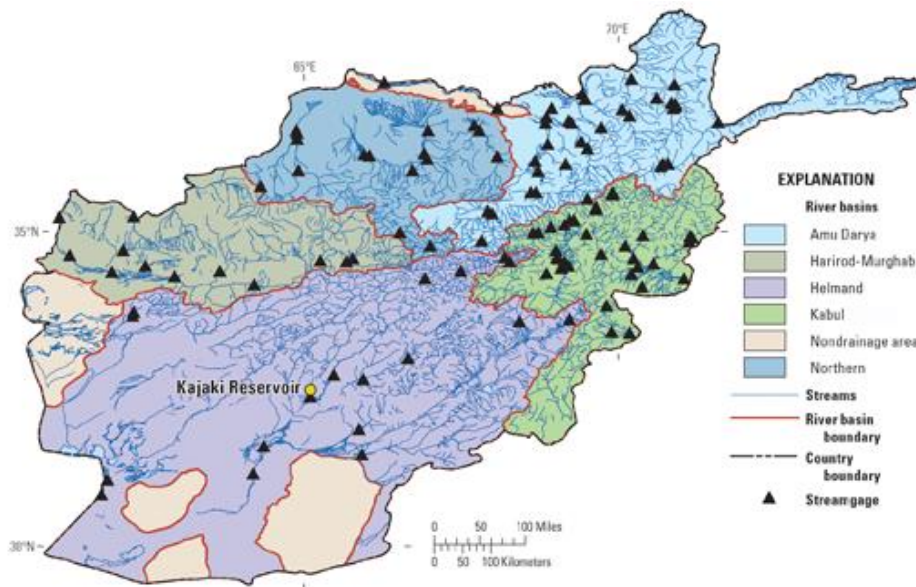


Figure 2. Locations of Afghanistan's major drainage basins, reinstalled stream gage stations and the Kajaki Reservoir, a major source for hydropower and irrigation in the Helmand River Basin. Credit: Thomas J. Mack, USGS. [8].

The Helmand river basin contains the longest Afghan river which forms the Afghan-Iranian border for 55 kilometers. Water from the Helmand basin is used primarily for irrigation.

The Kabul River flows through Afghanistan and Pakistan and represents approximately 26% of the available water resources in Afghanistan. There is presently no agreement between Afghanistan and Pakistan concerning the distribution of the water resources available in the Kabul River.⁵

⁶ King, Matthwe, Sturtewagen, Benjamin, "Making the most of Afghanistan River Basins, opportunities for Regional cooperation". February 2010, p-1

3. WATER RESOURCES DEVELOPMENT DIFFICULTIES

Drinking water supply and water for irrigation is the priority for the Afghanistan. But as the country develops further, additional water supplies will be required for anticipated mining and mineral processing activities, as well as for associated businesses and communities that will be vitally important to Afghanistan's future stability. But there are some difficulties as indicated below;

Following decades of invasion and civil war, Afghanistan lacked the technical capacity, the communications infrastructure, and the modern equipment necessary for effective hydrogeologic investigations of its water resources.

The difficulty of obtaining safe and reliable supplies of water in Afghanistan is heightened by the fact that water-resources data collection was suspended around 1980 due to civil strife and the Soviet invasion. Subsequently, much of the institutional knowledge relating to water resources was lost, most of the country's water monitoring equipment was destroyed, and the abilities of Afghan water scientists stagnated [8].

3.1 Recent Developments

Recent developments have begun re-establishing civil hydrologic expertise and have led to the creation of local and national groundwater monitoring networks and a national climatic network as well as functioning streamflow and reservoir water level gaging network.

Although further improvements are needed, these advances should assist Afghanistan's planners and managers to assess and monitor current and future water resources.

In 2004, U.S. Geological Survey (USGS) researchers arrived at the Afghanistan Geological Survey (AGS) headquarters in Kabul to begin a decade-plus long collaboration with AGS scientists. Since 2004, USGS efforts have focused principally on basic skill-building. For example, USGS scientists have provided training to Afghan scientists and technicians in using modern computerized techniques required for hydrologic monitoring and for maintaining large databases [8].

One of the first projects USGS and AGS engineers undertook was to investigate water resources in the Kabul Basin. By 2010, AGS engineers applying the lessons learned in Kabul had established similar groundwater monitoring networks in the major population centers

Meanwhile, collaborative work with the Danish Committee for Aid to Afghan Refugees, an international NGO, led to the development of a national network of more than 150 wells to monitor groundwater levels. Administered by Afghan engineers, this first national groundwater network will be vital to detecting and assessing regional trends in future groundwater levels and quality.

By the late 1970s, Afghanistan had a functioning stream flow and reservoir water level gaging network that consisted of 169 stream gages distributed across the country. This network operated until 1980 when most stream gages were destroyed or fell into disrepair. From 1980 to the early 2000s, Afghanistan's original streamflow records were misplaced or destroyed, and the data were lost.

From 2006 to 2010, USGS and MEW researchers worked to recover daily streamflow data from whatever historical documents hadn't been destroyed and could be located.

Nationwide, approximately 127 historical stream gages were re-established and supplied with modern equipment from 2008 to 2011 as part of a USGS and World Bank program.

In March of 2014, the United States Agency for International Development ("USAID") contracted with Laura A. Schroeder to conduct a three-week consultation mission in an active war zone in Kabul, Afghanistan. The goal of this mission was to provide international water law expertise in developing a decentralized and sustainable water use system by analyzing the current methods of the Country's governance within its various river basins⁷.

The mission focused on teaching Public Administration and Governance Training for the basin and local agencies, as well as members of the Technical Secretariat Council on Water. Through this training and teaching, the goal was to provide solid practical instruction to Afghanistan senior and technical staff to facilitate understanding of the deficiencies and challenges within the water sector, and to assist in implementing Afghan water code.

3.2 Climate: The Context for Water Resources

Effect of climate change is a critical unknown factor in Afghanistan's water resources development. "May Kabul be without gold, but not without snow," implores an Afghan proverb. Afghanistan relies on winter snowfall in the mountains to replenish the snowfields and glaciers that supply water to its perennial and ephemeral rivers and streams. Reductions of the mountain snowpack and glaciers due to climate change could have a profound effect on Afghanistan's water resources [8].

In 2010, the USGS and AGS assessment of Kabul Basin's water resources found that about half of the shallow groundwater supply wells could become dry or unusable due to declining stream flows and recharge under projected climate change by 2050.

4. WATER MANAGEMENT AND TRANSBOUNDARY AGREEMENTS

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. (Disagreements between Uzbekistan and Tajikistan are the reason why a memorandum of understanding between Afghanistan and Tajikistan on trans-boundary water use has been pending for years).

No bilateral or multilateral treaties have been signed on the Harirud and Murghab⁸.

⁷ Laura Schroeder, Therese Ure **River Basin Organization and Governance in Afghanistan** The XVth World Water Congress of the International Water Resources Association (IWRA) Edinburgh, Scotland, May 25-29, 2015.

⁸ King, Matthwe, Sturtewagen, Benjamin, "Making the most of Afghanistan River Basins, opportunities for Regional cooperation". February 2010, New York-USA

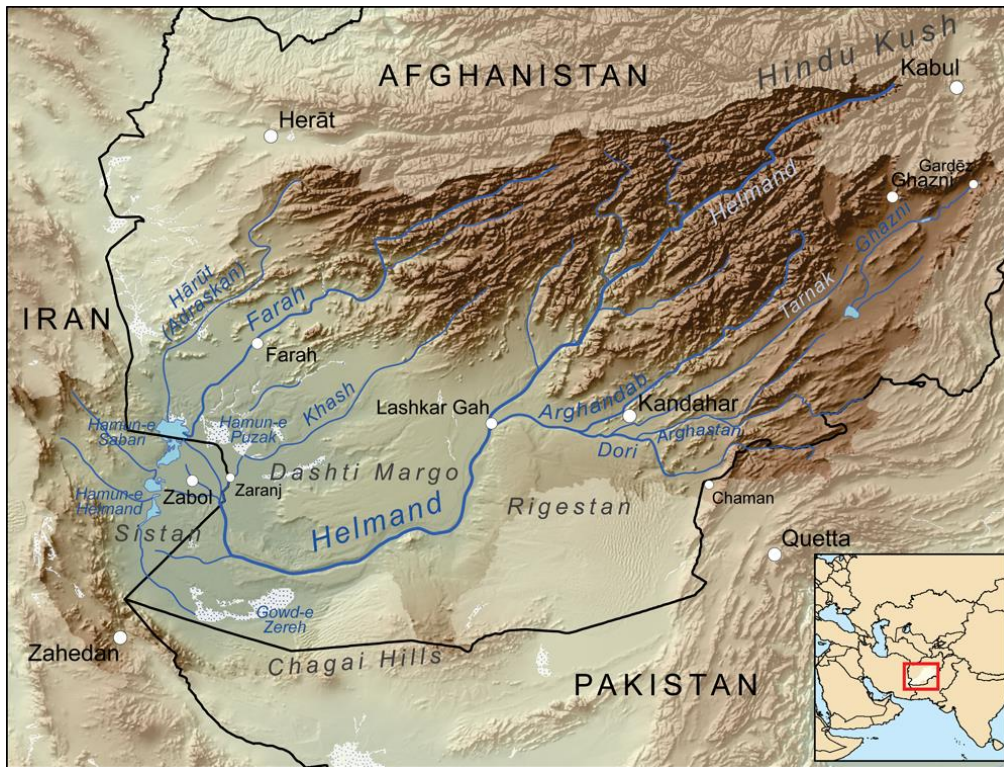


Figure 3. Helmand River Basin

Historically, cooperation and trust between Iran and Afghanistan on the issue of water has been limited. With the exception of an unbinding 1973 water accord that defined an acceptable rate of discharge from the Helmand, there are no formal water-sharing agreements. Trust was further eroded when the accord was breached by Afghanistan during a drought from 1998 and 2002. The development of more water infrastructure in Afghanistan, unbounded by agreements, will increase Iran's vulnerability⁹.

4.1. Hydropolitics of Afghanistan

Afghanistan is the only non-player country in the region although it's all rivers are transboundary. Afghanistan's reluctance in hydropolitics is partly due to having a weak bargaining position compared to its neighbors.

It is clear that after three decades of conflict, Afghanistan has a severe lack of technical knowledge, institutional capacity relative to its neighbors and very poor hydro-meteorological data. At the same time, it is also important to recognize that Afghanistan's neighbors have not undertaken any serious efforts to incorporate Afghanistan either. Existing frameworks for regional cooperation on some of the shared water resources continue to exclude Afghanistan¹⁰. But when Afghanistan is able to start developing water resources; the regional stability balance will be threatened. Because no bilateral legal frameworks on shared water

⁹ <http://www.stimson.org/spotlight/transboundary-water-sharing-iran-and-afghanistan/>

¹⁰ King, Matthwe, Sturtewagen Benjamin "Making the Most of Afghanistan's River Basins Opportunities for Regional Cooperation" Report of The EastWest Institute New York –USA

resources exist except for the 1973 bilateral treaty between Afghanistan and Iran on the Helmand River,

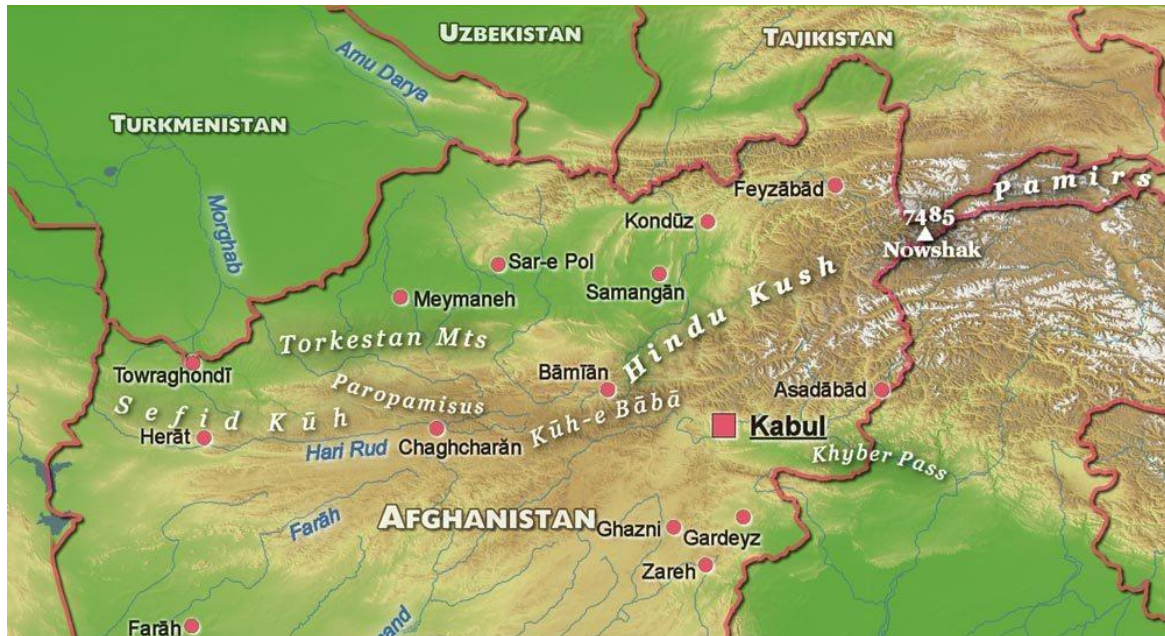


Figure 4. Marghab-Hari Rud, Kabul, Amu Darya River Basins

4.2. The Amu Darya Basin Agreements

Development of agriculture (in all riparian states) and hydroelectric power (in Tajikistan and Afghanistan particularly) depend heavily on the water resources of the Amu Darya. It is also crucial water to the livelihoods of 44 million people in the Aral Sea Basin.

Since 1873, Afghanistan and its northern neighbors—Russia, the Soviet Union, and the Central Asian states— have concluded agreements relating to the Amu Darya. But 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).

In 1977, Afghanistan sent a delegation to Tashkent and Uzbekistan to negotiate a water sharing agreement. The Soviet Union could only offer 6,000 cubic meters a year, which was 3,000 cubic meters short of the Afghan demand. An agreement failed to materialize¹¹

4.3. The Harirud-Murghab River Basin Agreements

The Harirud-Murghab River Basin represents about 12 percent of Afghanistan's water resources and is centered on the intensely irrigated area of Herat. It rises in the central Hazarajat

¹¹ David W. Rycroft and Kai Wegerich, "The three blind spots of Afghanistan: Water flow, irrigation development and the impact of climate change" (2009), p 3.

and flows west through north-east Iran before exhausting itself in Turkmenistan. No bilateral or multilateral treaties have been signed on the Harirud and Murghab.

A number of regional frameworks established Amu Darya Basin do not cover the Harirud-Murghab River Basin directly. Iran has indicated readiness to cooperate bilaterally and trilaterally with Afghanistan and Turkmenistan. However, bilateral and/or trilateral frameworks of cooperation are yet to be developed. Furthermore, Iran and Turkmenistan did not consult Afghanistan when jointly building the Doosti Dam on the Harirud, which has increased concerns in Kabul¹².

In 2005, Iran and Turkmenistan constructed the Doosti Dam, with each country agreeing to equal rights to the river; however, neither country consulted Afghanistan prior to constructing the dam. The current \$200 million dam project in the works to divert water from Iran to Afghanistan will severely restrict water flow to Iran¹³.

Because Afghanistan was not consulted prior to the construction of the Doosti Dam, Afghan officials state they have no plans to negotiate water rights with Iran prior to building the new dam. This project may potentially cause a great set back in the great strides towards peace which has taken place between these two countries

4.4. The Helmand River Basin Agreements

The Helmand River is a special river in terms of Afghanistan's Hydropolitics. It is the longest of Afghanistan's rivers, shared between Afghanistan and Iran and the only river basin on which Afghanistan has entered into a formal agreement with a neighbor. The Helmand River is at approximately 1,300 kilometers (800 miles). It rises in the Hindu Kush mountain crossing southwest, it forms the Afghan-Iranian border for 55 kilometers.

The water resources of the Helmand River Basin are used extensively for irrigation. Its water is crucial for Afghan and Iranian farmers in Sistan and Baluchistan alike. Therefore, implementation and expansion of various water infrastructure projects is raising the tension in the basin.

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. Iran and Afghanistan did not agree with the commission's 1951 report. However, the bilateral treaty on the allocation of the Helmand River's water resources. The agreement allocates 26 cubic meters per second to downstream Iran. However, the treaty was never fully implemented, and disputes arose over the terms of the allocation.

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

¹² King, Matthwe, Sturtewagen Benjamin "Making the Most of Afghanistan's River Basins Opportunities for Regional Cooperation" Report of The EastWest Institute New York –USA

¹³ Ibid.

disputes over the terms of agreement remained¹⁴. Improved Kabul-Tehran relations following the ouster of the Taliban have not yet yielded a solution. However, 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. Additionally, Iran and Afghanistan have made constructive efforts Hamun Lake. They have worked in close cooperation since 2003 with the United Nations Environment Programme (UNEP), the United Nations Development Programme, and the Global Environment Facility (GEF) through a process of trilateral sessions between Afghanistan, Iran, and UNEP.

As a downstream user of the water resources of the Helmand River, Iran has an obvious interest in cooperating with Afghanistan. Current Iranian technical assistance to the construction of a research institute in the Afghan Ministry of Energy and Water can serve as an example for the enhancement of regional data and information sharing.¹⁵

4.5. The Kabul-Eastern Basin Agreements

The Kabul River flows in eastern Afghanistan and northwestern Pakistan. It is approximately 700 kilometers long, of which 560 kilometers flow through Afghanistan and pass into Pakistan. It joins the Indus River

The water resources of the Kabul River are essentially shared between Afghanistan and Pakistan. Despite repeated attempts on both sides to reach an agreement on the Kabul River, such an agreement has not materialized.

The technical committee established in 2003 maintained that its efforts failed because it did not receive sufficient river flow data from Afghan authorities.

No institutionalized framework of cooperation on the Kabul River Basin currently exists. At the sidelines of the March 2009 meeting of the Economic Cooperation Organization, and Tajik leaders agreed to speed up implementation of projects on the water-energy nexus. Joint commitments of a similar nature were not made between Afghanistan and Pakistan.

5. SECURITY OF THE REGION AND WATER

Clearly, security and development became the key elements of contemporary international relations, with water being an essential basis for security and driving force behind development.

The Central Asian states established a series of regional institutions and agreements with the expressed intention of allocating the Aral Sea Basin's waters and protecting the Aral Sea. They began with the 1992 Almaty Agreement. In the following years a number of institutions were established.

But Afghanistan has not been a member of any of the water management related regional organizations, however. On the other hand, there is no evidence that the Central Asian states or the water bodies established have ever considered including Afghanistan. There is no textual exclusion to the fact that Afghanistan is an Aral Sea Basin state or contributor to the Amu Darya's waters.

¹⁴ Ibid

¹⁵ Ziaie, "Water Sector Strategy; MEW Water Sector Strategy (2008), p 28

Similarly, in a report recording IFAS's first ten years, Afghanistan was only mentioned as a potential problem. The report stated that Afghanistan's future water demands are a "big uncertainty" for the other riparian [1]. A subsequent ICWC-IFAS roundtable noted that there was a need for "concerted actions to develop the water management system in the region, ... due to the development of new irrigable lands in Afghanistan" (ICWC, 2005).

In neither instance did IFAS or member states suggest that Afghanistan's membership was a way of addressing these "uncertainties." No bilateral agreements have been reached between Afghanistan and the Central Asian riparian either. In fact, the only transboundary water agreement that the Karzai government has with any of its neighbors is with Iran over the Helmand (Hirmand) river (Government of the Islamic Republic of Afghanistan, 2007). The only Central Asian riparian that seems interested in serious dialogue with Afghanistan is Tajikistan. [5].

Therefore, regional security is very much depending on transboundary water use and management of the Afghanistan. In other words, Afghanistan's water development project and Hydro policy will play very important role on the regional security

6. CURRENT CONDITIONS AND FUTURE OF THE REGION

Considering the last section before this part, it is not difficult to see that there are no regional mechanisms for cooperation on water in Southwest Asia that involve Afghanistan. With the exception of the 1973 bilateral treaty between Afghanistan and Iran on the Helmand River, no bilateral legal frame works on shared water resources exist, let alone regional frameworks.

The Iran-Afghanistan dialogue on the Helmand River is the most developed. Additionally, recent agreements in the framework of ECO, RECCA, and other forums could start to serve as a fertile ground for bilateral and regional water diplomacy.

Regional cooperation requires political will, which, to date, has not been forthcoming. Several existing processes have shown the potential for bilateral—if not regional—cooperation on water.

Afghanistan is not a water dependent country from abroad but currently highly dependent on foreign aid to reach its national development goals. Since 2001, Afghanistan has received more than \$15 billion in official development assistance, not including an estimated \$50 billion in off-budget security expenditures.

Water resources development to stabilization and development in Afghanistan is therefore immense. Because of that many donors are giving considerable attention to the development of Afghanistan's water sector. But starting this development will be directly related with the hydro politics of Afghanistan for improvement of the cooperation.

7. CONCLUSIONS

Water is more important to Afghanistan than any mineral or other natural resources. Population growth, urban expansion, more intensive agriculture and prospective mining operations will all require more water that is under the effects of climate change.

A comprehensive understanding of Afghanistan's most transboundary water resources by its scientists, engineers, political leaders and citizenry is vital for the future of this struggling nation.

Afghanistan's reluctance to engage in regional dialogues on water has to be attributed, among other concerns, to the country's limited hydro-meteorological capacity, the lack of adequately skilled human resources (with solid knowledge of international law and the ability to negotiate

in international forums), and a knowledge gap of about thirty years of hydrological data due to war. Therefore, they are 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.

There is unprecedented interest from the international community for Afghanistan's development, including considerable aid packages for the water sector.

The international community efforts in a regional context, rather than a merely national context would be more important for Afghanistan's water development. The international community should look beyond merely national realities and incorporate regional water strategies into political and development agendas

The country needs for urgent investment in capacity development and data collection which an area where the international community has much to contribute.

Programs such as those provided by USAID developing water resource administration and governance provide education and support to those who might be able to negotiate international water agreements that will make a difference in stabilizing the region.

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Africa is coming. Who is ready to welcome?



SUMMARY

Giulio Meotti, Italian journalist and author pointed out an important issue in his last article about demographic pressure which comes from Africa to Europe (1).

According to the UN Projection, during the next thirty years, the population of Africa is expected to increase by one billion. Global population growth is slowing, but Africa and Asia will still see a large population expansion. As a whole, the world population is growing older. Ageing is now also accelerating in low-income countries, where the process tends to start earlier and is becoming more pronounced in rural areas

Should these population projections materialize, the increases could seriously jeopardize the overall development prospects of these countries. Rapid population growth changes the population structure, with younger generations making up an increasing share of the overall population.

Between 2015 and 2050, in low- and middle-income countries, the number of people between 15 and 24 years of age is expected to rise from about 1 billion to 1.2 billion. Most of these young people are expected to live in sub-Saharan Africa and South Asia, particularly in rural areas, where jobs will likely to be difficult to find.

Without sufficient employment opportunities, this population trend may lead to a more rapid rate of outmigration. The impacts of outmigration are already being felt in some emigration destinations, not only at the national level, but also abroad, notably in Europe and high-income countries in other regions. In this article we try to highlight the most applicable and right approach to the problem.

Keywords: Africa, Immigration, Younger Population,

1.INTRODUCTION

The current situation and estimation about Africa's future will be dominant for the modern World. We realized that modern World did not even take into consideration this issue. But we will realize in soon that we must have been. Why international community should take into account the Africa more than before? The answer of this emerging question is clear.

If they still live without electricity, water and food in this black continent in the 21 st Century, there will be one way to use for them: Outmigration.

Because;

- During the next thirty years, the population of Africa is expected to increase by one billion.
- The French economist Charles Gave recently predicted that France will have a Muslim majority by 2057 -- and this estimate did not even take into consideration the number of expected new migrants.
- No doubt, Africa's exploding population will try to reach the shores of a wealthy, senile Europe,

This situation forced some European experts to ask the question as “Will Europe protect its borders and civilization before it is submerged?”

Or the question can be asked in a different way as we did. Africa is coming. Who is ready to welcome?

According to the UN's annual demographic report, "[World Population Prospects](#)," one-sixth of the world's population currently lives in Africa. By 2050, the proportion will be one-quarter, and at the end of the century -- when Africa will have four billion people -- one-third. (1).



2.AFRICA TODAY,

In Africa today, there are four times more births than deaths. According to figures for 2017, the total fertility rate is 4.5 children per woman, against 1.6 in Europe. During the next thirty years, the population of Africa is expected to increase by one billion. It is not hard to imagine

how mass illegal immigration will affect Europe through such unprecedented demographic pressure. African demography has already begun pressing on the "old continent". (1)

3. EUROPE TODAY

When supporters of open borders state **some** millions, migrants are nothing in a European population of 500 million people, some experts were against this approach explaining that this comparison is wrong, the right comparison is between recent arrivals and new births

In 2015 and 2016, children were born in Europe. In the same period, according to a Pew Research Center report, approximately 2.5 million migrants reached Europe. And, as many countries, such as France, refuse to list the new births according to ethnic origin, there is no way to know how many of Europe's births can be attributed to Muslim communities (1).

The UN studies also report that "Europe" means not only the EU but enlarged continent to the east. In 1950, Europeans numbered 549 million; in 2017, 742 million. In 2050 they are expected to number 715 million. In 2100 the number is projected to drop to 653 million. So, in 30 years, due to the demographic collapse, Europe will lose 30 million people and, by the end of the century, almost 100 million (1). "Birth control" has worked most effectively in Europe, which demographically did not need it, and worst in Africa, which did.

Aging Europe

Figure 1.2 Population growth to 2100, by region (medium variant)

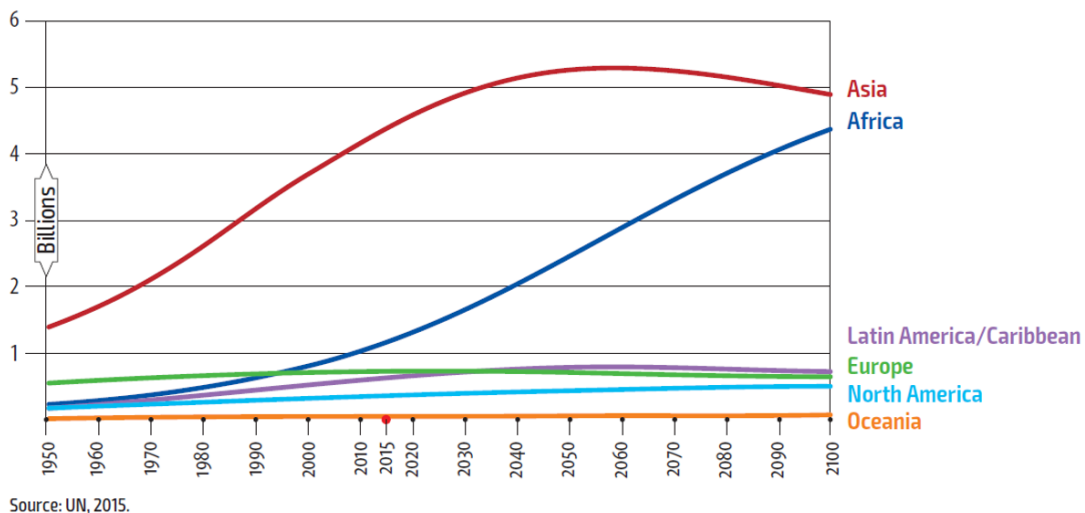


Figure 1. Population growth to 2100, by region (medium variant) Source: UN, 2015.

Europe is committing social euthanasia. Germany is projected to lose 11 million people; Bulgaria will go from 7 to 4 million; Estonia, from 1.3 million to 890 thousand; Greece, from 11 to 7 million; Italy from 59 to 47 million; Portugal from 10 to 6 million; Poland from 38 to 21 million, Romania from 19 to 12 million and Spain from 46 to 36 million. Russia is expected to shrink from 143 to 124 million (1).

Among countries with population growth, France is expected to grow from 64 to 74 million, and the UK from 66 to 80 million. Sweden is projected to grow from 9 million to 13 million, and Norway from 5 million to 8 million. Belgium's population of 11 million is expected to increase by 2 million. These five European countries are also among those with the highest proportion of Muslims (1). In addition, last week a new Eurostat report related that the number of deaths in the "old continent Europe" rose 5.7% in one year, due to a population that is aging, but that the demographic growth in high-density immigrants areas is tremendous:

The French economist Charles Gave recently predicted that France will have a Muslim majority by 2057 -- and this estimate did not even take into consideration the number of expected new migrants(1)

Recently, the UK Office of National Statistics announced that this year, among newborn boys, Muhammad is one of the most popular names. The same is true in the Netherlands' four biggest cities and Oslo, Norway(1).

4.CONCLUSIONS

No doubt, Africa's exploding population will try to reach the shores of a wealthy, senile Europe, which is already undergoing an internal demographic revolution. One can approach to this issue to retain its culture making hard-headed decisions, this may lead to protect its borders and civilization from mass migration. But to achieve this goal, protection measures will not be only enough. We need to change our paradigm for globalization.

From the beginning of the 21 st Century we have seen some positive approach to solve water, energy, food security problems in Africa that have been urgent to solve. We see that this international approach has also changed the historical Nile Hydropolitics building Grand Ethiopian Renaissance Dam that is almost completed. We also see some dams and irrigation structures in other African Countries.

All these developments indicate a new approach to Africa's chronic problems. In a way Africa is in motion as we indicated in our article (3). But It needs stronger and faster motion than that of seen till now.

We are sure that nobody including Africans don't want to immigrate if they are not forced by difficult life standards in their home country. We should look at the root of the problems more than protective measures from the result of them.

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Storing Water in Dam Reservoirs: Why is it Necessary?

SUMMARY

The world population is growing by leaps and bounds and the impact of this growth on water resources is such that we shall need more water for drinking, agriculture, energy generation, industrial production, and so on. Moreover, life-style is changing all over the world and a direct impact of this trend is a very significant increase in water use. For these reasons, demand for water is steadily increasing throughout the world. However, freshwater resources are limited and unevenly distributed both in time and place. In addition to this, seasonal variations and climatic irregularities in flow lead to the inefficient use of river ¹⁶runoff, with flooding and drought causing problems of catastrophic proportions.

From the beginning of the human history, for almost 5 000 years, dams have served to ensure an adequate supply of water by storing water in times of surplus and releasing it in times of scarcity, thus also preventing or mitigating floods and making a significant contribution to the efficient management of finite water resources that are unevenly distributed and subject to large seasonal fluctuations. In the other words, the construction of dams in the concept of water resources management has always been considered as a basic requirement to harmonize the natural hydrological regime with the human needs for water and water related services.

Purposes to be served by such a project usually include water supply, irrigation, flood control, hydropower generation, navigation, recreation, pollution abatement, industrial use, fish and wildlife conservation and other environmental considerations, salinity and sediment control, and recharge of groundwater. To meet these purposes, a number of dams are constructed to control and regulate the natural flows. This regulation function is obviously the main reason for creating reservoirs by constructing dams.

Water storage facilities are being constructed in Turkey as in any other country in the world, in order to make benefit of water resources which are not regular in terms of time and space, being aware of the fact that total level of amount may be enough in any given year or long-term period. Water storage facilities are also being constructed in order to prevent flood and other water damages.

By the end of 20th century, there were 45000 large dams in over 150 countries. According to the same classification there are 625 large dams in Turkey. All over the world, 50% of the large dams were built mainly for irrigation (16). It is estimated that dams contribute to 12-16% of world food production. Almost all major dams are built for hydropower (16).

Hydropower currently provides 19% of worlds total electricity supply and is used in over 150 countries. Approximately 12<% of large dams are designated as domestic water supply dams (16).

According to DSI report (17), in Turkey, 629 small¹⁷ and large dams, 384 irrigation schemes, 98 water supply systems have been opened by State Hydraulic Works (DSİ) since 2005.

Private sector companies have also built 510 river and canal type hydroelectric power plants since 2008.

Giving some figures from the water resources projects in Turkey, this paper generally presents the flow regulatory role of dams in water resource management in domestic rivers as well as transboundary rivers.

Keywords: Dams, Turkey, Dam reservoir, Euphrates river.

1. INTRODUCTION

1.1 Basic Concepts of Dam Reservoirs

The word of “reservoir” is originally stemming from “to reserve”. In this meaning, this word implies to keep something for a special purpose. Accordingly, keeping the water for some special purposes, dams are a major source of hydroelectric power, flood protection, recreation and domestic, agricultural and industrial water supplies.

A dam is a structure built across a stream, river or estuary to retain water. Its purposes are to meet demands for water for human consumption, irrigation, or industry; to reduce peak discharge of floodwater; to increase available water stored for generating hydroelectric power; or to increase the depth of water in a river so as to improve navigation. An incidental purpose can be to provide a lake for recreation **(1)**.

While demand for water is steadily increasing throughout the world, freshwater resources remain limited and unevenly distributed. Water availability is critical to any further development above the present unsatisfactorily low level, and even to the mere survival of existing communities or to meet the continuously growing demand originating from the rapid increase of their population **(2)**. Dams are considered as an important issue in the sustainable management of our finite water resources. Those resources are subject to increasingly competitive demands as global population growth exacerbates tensions over the water needed to produce energy and to ensure food security.

Dams store water in the reservoir during times of excess flow, so that water can be released from the reservoir during the times that natural flows are inadequate to meet the needs of water users. Dams are important because they help people have water to drink and provide water for industry, water for irrigation, water for fishing and recreation, water for hydroelectric power production, water for navigation in rivers, and other needs. Dams also serve people by reducing or preventing floods.

¹⁷According to ICOLD classification, large dam is one with the height of 15 m or more from the foundation. If dams are 5 to 15m high and have a reservoir volume of more than three million cubic meters, they are also classified as large dams. Based on this definition, there are 45000 large dams around the world.

1.2 Purposes of Dam Reservoirs

There are various demands for water, including irrigation; domestic uses (*showering, watering lawns and gardens, etc.*); industrial uses (*water used for processing, washing and cooling in facilities that manufacture products*); thermoelectric power uses (*water used for cooling to condense the steam that drives turbines in the generation of electric power with fossil fuels and nuclear or geothermal energy*); and in stream water uses (*water used for hydroelectric power generation, navigation, recreation, and ecosystems*) (1).

The purposes of dams are grouped into the two main categories, single-purpose dams and multipurpose dams (3).

According to the World Commission on Dams (WCD) Study conducted for all over the world, most (48% approx.) dams in the first category are for irrigation and therefore contribute greatly to food production. A considerable proportion (15% approx.) of single-purpose dams serve for domestic and industrial water supply. A substantially smaller number (20% approx.) generate electricity. The same study informs that other purposes include, in decreasing order of importance, flood control (8%), recreation (4%) and, to a lesser degree, inland navigation and fish farming, and that multi-purpose dams account for a large proportion of the total - 7 400 out of the 25 400 reported - nearly 30 per cent of the total. It is also added that multi-purpose dams are increasingly important for regional economic development.

The majority of large dams are built for irrigation; almost all major dams are built for hydropower. Nearly one-fifth of the world's electricity is generated by dams. Dams also provide flood control, supply water to cities, and can assist river navigation. Many dams are multipurpose, providing two or more of the above benefits.

Irrigation comes first in this category also, followed by flood control, hydropower, domestic and industrial water supply and recreation, with fish farming and navigation.

Since the groundwater reservoirs presently tapped to provide about half of irrigation, drinking and industrial water supply are already heavily overdrawing in many parts of the world, the only large-scale solution apart from saving water is to increase the share of surface water from storage reservoir. According to the WCD Study, flood control has always been a particularly significant motive for dam construction and frequently its primary purpose. In the WCD Report, it is informed that it will continue to be so, as long as about 40 percent of all fatalities from natural catastrophes worldwide are caused by flooding.

Compared with the main requirements of irrigation, domestic and industrial water supply, energy production and flood control, the other purposes and benefits of dams such as navigation, fisheries and tourism, improvements to the infrastructure, job creation and on-site training, are of generally minor importance, but must nevertheless not be disregarded or underrated.

1.3. Major Benefits of Dam Reservoirs

According to the study (4) conducted by United States Committee on Large Dams (USCOLD), today living conditions of billions of people are certainly improved by the construction of dams. Besides the essential need for potable water, production of food through irrigation, energy and power production, flood control, provision of recreational facilities is

among the major benefits of dams. Regarding to the benefits of the dams, the following aspects could be listed as following:

- In the general meaning, dams allow rivers to be used for navigation.
- Dams create lakes for fishing and recreation.
- Dams are important because they provide water for irrigation.
- Large storage dams regulate the flow of water and sediments down the river and impact the functions and services of downstream ecosystems and their biodiversity in many different ways, especially for wildlife or for fisheries for example.
- As we are all well aware, one of the major benefits of dams is the production of hydroelectric energy. Generating clean energy of hydropower, dams contribute significantly to reducing air pollution. Hydropower is the most plentiful and most efficient renewable energy resource, contributing considerable percent of all renewable electric energy produced in the all over the World. According to the study realized by the USCLD in the USA, the efficiency of a modern hydropower plant exceeds 90 percent, which is more than twice the efficiency of a thermal plant.
- Dams provide "cheap" and "clean" energy, increase food production and control flooding. Examples of this preconceived bias include: The rationale for the development of large dams is based on the generation of clean power and improved management of water resources
- According to the World Bank Report (5), namely "*The World Bank's Experience with Large Dams: A Preliminary Review of Impacts*", without the exploitation of rivers, the world would be a much different place, and would be able to support fewer viable human settlements. Life for many people in the great river basins of the world would be a cycle of drought, floods and famines.
However, this report which was prepared by WB Operations Evaluation Department has been heavily criticized by another study (6) conducted by International Rivers Network (IRN).
- Availability of water can also lead to significant greening of barren lands. Yet another benefit often cited is the creation of habitats for water bodies. As an example, it is informed in the different sources that many of India's bird sanctuaries are located on and round artificial reservoirs.
- On the plus side again, the dam will be capable of pumping out electricity from the generators, each equal to a medium –sized nuclear reactor. This cleaner hydroelectric power would offset the burning of polluting coal, prevent catastrophic flooding.

1.4.Concerns on the Dam Reservoirs

Prof. Kader Asmal states that dams provide electricity and fill irrigation canals to boost industrial and agricultural growth, as well as managing floods and storing waters for times of drought. He also stresses that these benefits sometimes come at certain costs in social, economic and environmental terms, implying the adversarial debate over dams illustrates the tensions between nations (*over shared waterways*) and within nations (*as environmentalists, communities displaced by dam reservoirs, and other affected people battle government, utilities and farm interests*).

Dams can provide hydro-power, irrigation and flood control. These are developmental benefits, but there are also costs in human, environmental and economic terms. The public debate on large dams has been characterized by the increasingly adversarial tone adopted by dam advocates and opponents. The breakdown in constructive dialogue between interested parties in the dam's debate has had ramifications in areas ranging from the achievement of civil society consensus on sustainable development, to the availability of financing for dams and their alternatives.

- There are some concerns that water uses are contributing to drought. This is believed as mainly a result of considerable amount of evaporation losses from the huge sizes of surface areas of reservoirs.
- Large dams have provoked opposition for numerous social, environmental, economic and safety reasons. The main reason for opposition worldwide is the huge numbers of people evicted from their lands and homes to make way for reservoirs.
- The livelihoods of many millions of people also suffer because of the downstream effects of dams: the loss of fisheries, contaminated water, decreased amounts of water, and a reduction in the fertility of farmlands and forests due to the loss of natural fertilizers and irrigation in seasonal floods. Dams also spread waterborne diseases such as malaria, leishmaniasis and schistosomiasis.
- According to the study (7) conducted by Ron Corso, Mead & Hunt, Inc., dams can stop regular annual floods but often fail to hold back exceptionally large floods. Because dams lead people to believe that floods are controlled, they lead to increased development of flood plains. When a large flood does come, damages caused are often greater than they would have been without the dam.
- When these high costs, delays and risks of low river flows are factored into calculations of the costs of electricity it can be seen that hydropower is now an expensive form of power generation. Some scientists do not consider hydropower as clean power because of the destruction of river ecosystems and its many social impacts. Internationally, private investors in power projects are largely avoiding large dams and prefer to invest in cheaper and less risky gas-fired power plants.

1.5 The Advantages of Hydropower and The Role of Dams in Hydropower Generation

It is a well-known fact that energy is one of the most important commodities for the satisfaction of physical needs and for providing economic development of modern society. Meanwhile energy needs are continuously growing. The demand for electric power continues to grow rapidly.

Recently, new problems have evolved with the exponential growth of electrical energy demands. However, these are the issues of water supply for energy production and the impact of energy developments on climate and the global environment.

To date, the world energy market has depended almost entirely upon the non-renewable, but low cost, fossil fuels. According to the report (8) by International Energy Agency, released in March 1999, energy produced by hydroelectric developments throughout the world provides approximately one-fifth of the world's total electrical energy.

Hydropower is solar energy in naturally and ideally concentrated form that can be utilized with the help of a mature and familiar technology with unsurpassed rates of efficiency and without depriving future generations in any way of raw materials or burdening them with pollutants or wastes. According to the study (9) prepared for Water and Sustainable Development International Conference, in March 1998, it is informed that, with a total annual generation of 2.1 million GWh, hydropower accounts today for 20 percent of electricity production and about 7 percent of total energy production worldwide. It is also given that, even at a conservative estimate, the total exploitable hydro-potential in the world amounts to at least six times as much.

Given the foreseeable depletion of fossil fuels, which presently are used to satisfy three quarters of primary energy requirements worldwide, plus the problem of the greenhouse effect and global warming, there is an urgent need to gradually replace them with methods of energy production which do not release CO₂, (or *airborne mercury from coal-fired plants*) into the atmosphere and which draw on renewable sources of energy. In the short and medium term, however, the predominant sources of renewable energy that will permit large-scale exploitation will be biomass and hydropower, before new sources like the direct harnessing of the sun's energy by photovoltaics will be ready to make contributions of the same order of magnitude (10).

Conventional electricity supply options include thermal (*coal, oil and gas*), nuclear and hydropower of different scales. These technologies currently dominate global electricity generation (*thermal 62%, hydraulic 20%, nuclear 17% and all other 1%*) (3). Use of co-generation particularly, and geothermal and wind generation both for isolated supply and small to medium scale grid feeding applications is small but increasing on a global level.

Hydropower has a long list of positive characteristics that explain its strong support and promotion. For one thing, it is highly efficient. In addition to the power generated, the advantages of hydropower are many – such as flood protection (commonly undervalued), flow regulation, multiple use and fossil fuel avoidance. The other major beneficial aspects of the hydropower can be listed as following:

- Because hydro is a domestic resource, governments and utilities in developing countries often prefer hydro generation over electricity produced from fossil fuels, which must be imported or, if the nation has its own supplies, are valuable sources of export revenues.
- In addition, the relatively low maintenance cost and simplicity of operation associated with hydro projects are strong pluses in countries where the more complex maintenance and operating logistics of thermal plants pose serious problems.
- Although water is one of the two essential components in the production of hydroelectric energy, this is essentially a non-consumptive use as well as a non-polluting one. For example, in the production of thermal-electric energy, water is required in practically all technical stages from the boring of test wells in oil and gas exploration to the transformation of fossil and nuclear fuels into electrical energy at thermal power stations - uses which are largely consumptive and/or polluting.
- Hydropower is a source of electrical energy that is continually renewed and available in the runoff segment of the hydrological cycle. Energy from flowing water offers something unique to a nation's economic development.
- In the report (11) prepared for the Big Dams Debate of World Bank, Robert Goodland states that hydropower is more efficient than most methods of converting mechanical energy to electrical energy, averaging 85 percent efficiency (*versus 50 percent for the best*

- gas turbines*) and it is more reliable (*for example, fewer outages*) than any fossil-fueled plant, responding to rapid changes in load and is lower in cost than other types of power.
- Hydroelectric plants have long life, require very little maintenance, and use water, a renewable energy resource. As long as the water continues to flow, nothing else is needed, so no consumption of fuel or production of heat is involved in the electricity generation. After construction of the plant, very few people are required for the maintenance of the project.
 - In addition to these good points, because it was possible to transport the energy produced at dams for such great distances, hydroelectric power is commonly considered as a very attractive and economically logical option.

Besides to this, very often, hydropower pays for multipurpose benefits. When this is taken into account, and when all environmental and social costs are internalized, hydropower compares favorably with other sources of energy. When compared to other sources of energy, hydropower can be superior, similar, or deficient in comparison. When compared to fossil fuels, a non-renewable resource, hydropower does not produce nearly as much energy. However, hydropower does have the preferable characteristics of being efficient, non-polluting, and renewable (while fossil fuels are quickly becoming scarce and depleted). Hydropower exhibits the same beneficial characteristics over the other non-renewable energy source, nuclear energy. While nuclear energy has the advantage of being able to exist in areas that hydropower cannot (areas of low relief and inadequate amounts of water), "it cannot compare to the cleanliness and inexhaustible amount of fuel used in a hydroelectric plant". In comparison to other renewable sources of energy, hydropower shares much in common. Both solar power and hydropower need the sun to create energy. Solar power uses the sun's power directly, while the sun evaporates water and deposits it upstream, indirectly making hydropower possible. Hydropower has the advantage of creating recreational areas for visitors to enjoy. Hydropower, solar power, and wind power all require large amounts of land to generate electricity. Wind power, hydropower, tidal power, and geothermal energy are all limited to locations where the elements needed to fuel the project are available. Successful tidal power projects, however, are restricted to very specific coastline configurations, and as a result are not as numerous as hydropower plants. Hydropower has an advantage over geothermal energy in that it has a continuous supply of fuel. Geothermal plants must consider the "shifting of geothermal activity and the possible exhaustion of the exploited fuel from that area." Biomass too, is renewable, however it has the disadvantage of producing pollution when burned (12).

2 WATER RESOURCES OF TURKEY

2.1 General Information

According to the statistics (13) conducted by the General Directorate of State Hydraulic Works (DSI) of Turkey, all water resources in Turkey are thoroughly observed and evaluated through the hydrological and meteorological network extended all over the country. With a mean annual precipitation of 643 mm, it is assumed that yearly precipitation brings 501 km³ of water. While 274 km³ of this quantity returns to the atmosphere through evapotranspiration from ground and water surfaces as well as from plants, 69 km³ feed the underground water reserves through infiltration from the surface, therefore a total of 186 km³ of which 158 km³

come from the precipitation and 28 km³ come from the underground water reserves, flow into the sea and into the lakes through rivers and streams of various sizes.

Furthermore, based on flow observations it is determined that 7 km³ water flow into Turkey every year through the rivers from neighboring countries. Accordingly, Turkey's surface flow potential is calculated as 193 km³ keeping in mind that significant changes may occur every year depending on meteorological conditions. On the other hand, consumable water potential on the basis of current technology and economics is 110 km³.

There are 26 hydrologic basins in Turkey. The largest five basins with respect to yearly water potential is Euphrates (31.61 km³). Keeping water under control or making arrangements for beneficial use of water constitute the object and aim of the projects intended for developing water resources. Development of water resources including production of electricity, have always been considered to be a national policy and the General Directorate of DSI was established in year 1954 for the execution of projects under the leadership of a governmental institution.

Owing to considerable variations observed in the run-offs in terms of seasons and years, it is absolutely necessary on the major rivers in Turkey to have water storage in order to ensure the use of the water, when it is necessary. Consequently, for these reasons, priority has always been given to the construction of water storage facilities. Significant progress was registered in the construction of dams since the establishment of DSI in 1954.

However, projects which further to their national nature also have an international character owing to water flowing into the lands beyond the national borders often show a multipurpose and complex characteristic, as being in the Euphrates River.

2.2 Hydropower Potential of Turkey and Needs for the Dam Construction in Turkey

In order to meet the increasing demand, Turkey showing a rapid social and economic progress must produce, continuous high quality, reliable and economical electricity by taking into consideration all environmental effects. Development of projects by making use of the energy resources available in Turkey and making necessary investments for this purpose are therefore required. The local energy sources are hydro, mainly in the eastern part of the country and lignite. Turkey has a large potential for renewable energy sources.



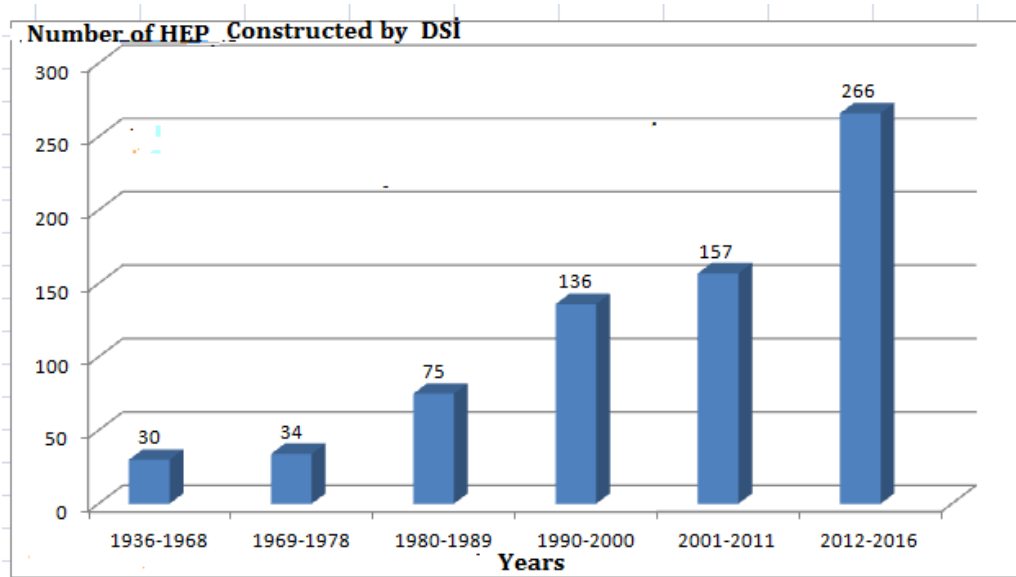
Figure1. Dams in Turkey (2005).

As stressed in the previous sections, for the production of electrical energy, hydroelectric power plants, in comparison with fossil and nuclear fuel thermal, geothermal and natural gas power plants have two significant advantages as they can be used for peak operation as well as they are renewable. In terms of initial investment cost with the exception of natural gas power plants and in some special cases hydroelectric power plants are in a position to compete with other thermal and nuclear power plants. They are the most economically operated power plants causing very little damage to environment.

2.3 Reservoir Development by Years in Turkey

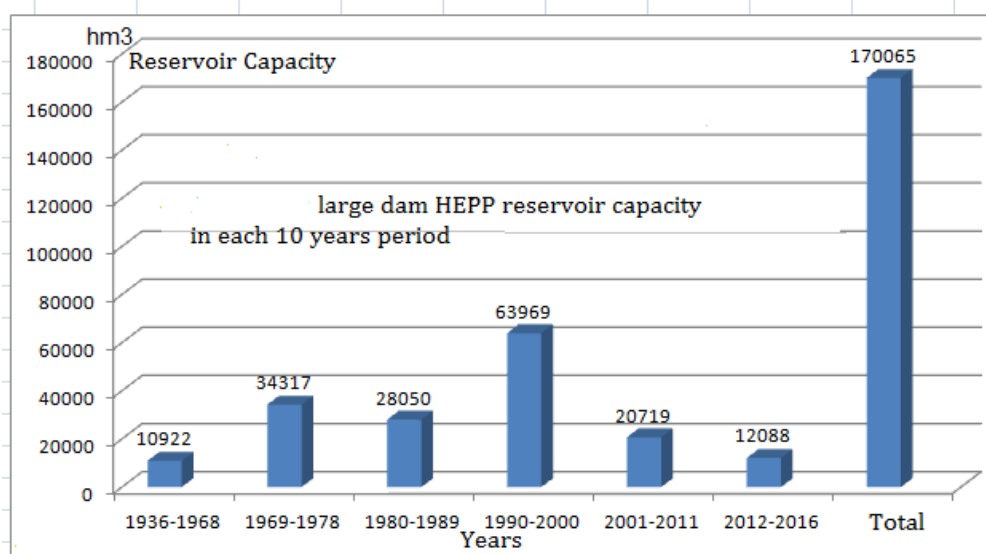
Using State Hydraulic Works' statistical data, it is developed some graphs about increase in number of large and small dams and their reservoir capacity.

These graphs are given in Figure2, Figure 3, Figure 4 and Figure5.



Source : State Hydraulic Works (DSİ)

Figure 2. Number of Large Dams and HEPP constructed by DSI



Source : State Hydraulic Works

Figure 3. Large Dams and HEPP reservoir capacity constructed by DSI in each 10 years period.

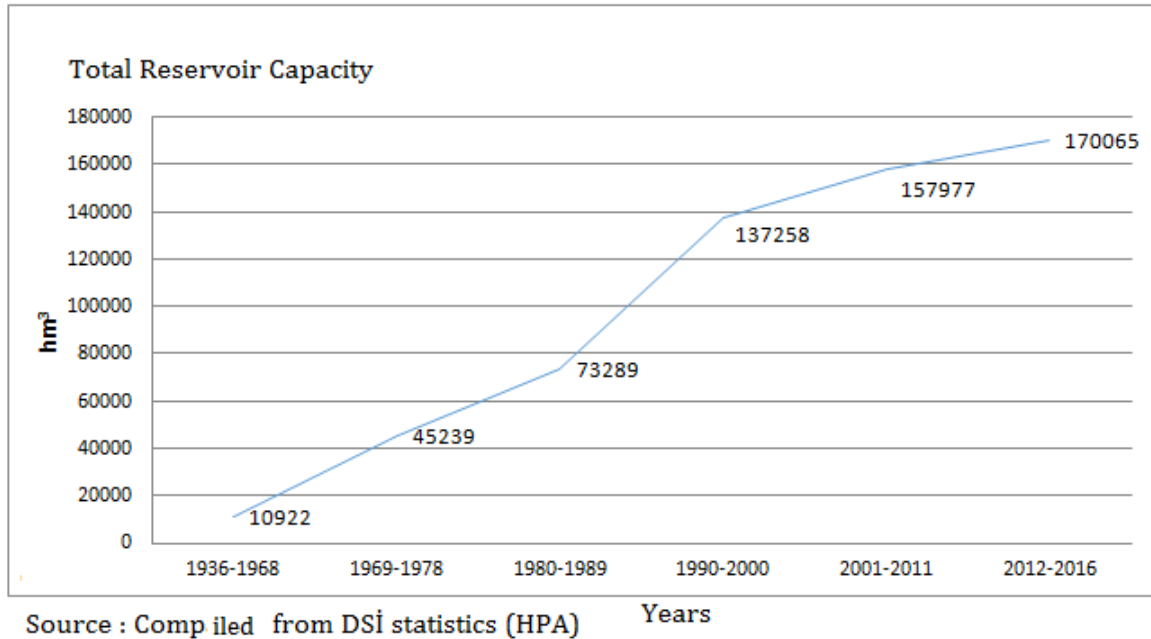


Figure4.Increase in Large Dams and HEPP total Cumulative Reservoir Capacity Constructed by State Hydraulic Works (DSİ) in Turkey

Figure5.

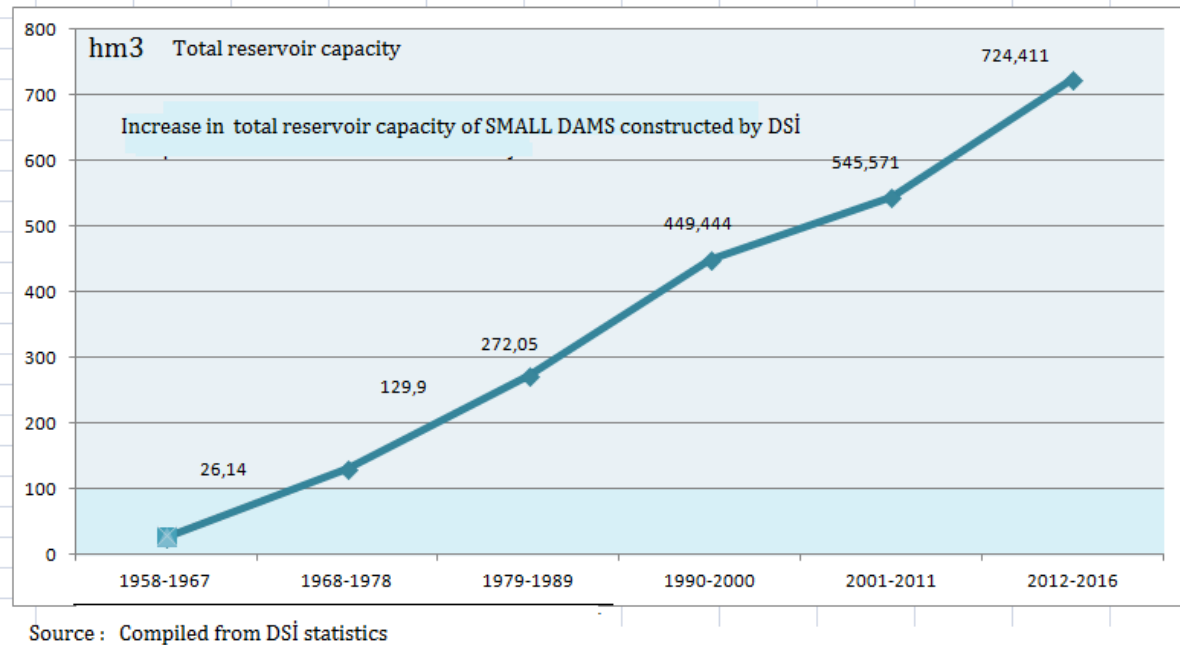


Figure 5. Increase in total reservoir capacity of small dams constructed by DSI

Reservoirs regulated flow regime in the Euphrates River Basin

Since the 1970s, the upstream riparian Turkey has become a strategic country in water resources management in the Euphrates Basin. Its water infrastructure projects and programmes, particularly GAP, have greatly impacted water resources throughout the basin, modifying and regulating the natural flow regime of the Euphrates

The first large project on the Euphrates in Turkey was the Keban Dam, which was built in the 1960s and completed in 1974. It is the farthest upstream of a series of Turkish dams on the Euphrates, serving the dual purpose of hydropower generation and flow regulation. The Karakaya Dam, which was completed in 1987, was the first dam built as part of GAP. It was followed five years later by the project's centerpiece, the Ataturk Dam. Since the 1970s, the upstream riparian Turkey has become a strategic country in water resources management in the Euphrates Basin (14)

Turkey's water infrastructure projects and programmes, particularly GAP, have impacted water resources throughout the basin, modifying the natural flow regime of the Euphrates and affecting other riparian's water use patterns.

When we look at these effects, we can also see positive flow regulation effects as it is indicated in the Inventory (14).

From its origin in Turkey until its confluence with the Tigris, the Euphrates crosses several climatic zones. Mean annual precipitation in the Euphrates Basin ranges from approximately 800 mm in the Turkish headwaters in the north to 150 mm in Syria and just 75 mm in southern Iraq.

The Euphrates originates in a mountainous Mediterranean climatic zone, which is characterized by hot, dry summers and cold, wet winters. In the mountainous headwater areas, precipitation predominates in autumn, winter and spring with a mixture of rain- and snowfall in winter.

Figure 6 illustrates that mean annual precipitation gradually decreases to the southwest to about 300 mm near the Syrian-Turkish border. The mild influence of the Mediterranean Sea further decreases inland and to the south. Rainfall is sparse in the arid climate of the Iraqi Lowlands (Mesopotamian Plain), with an annual average of 150-200 mm falling mainly in the winter months. Summers are dry and hot with daytime temperatures of up to 50°C. (14).

This climate condition causes 3 times higher evaporation from water reservoirs located in Syria and Iraq than those of located in Turkey

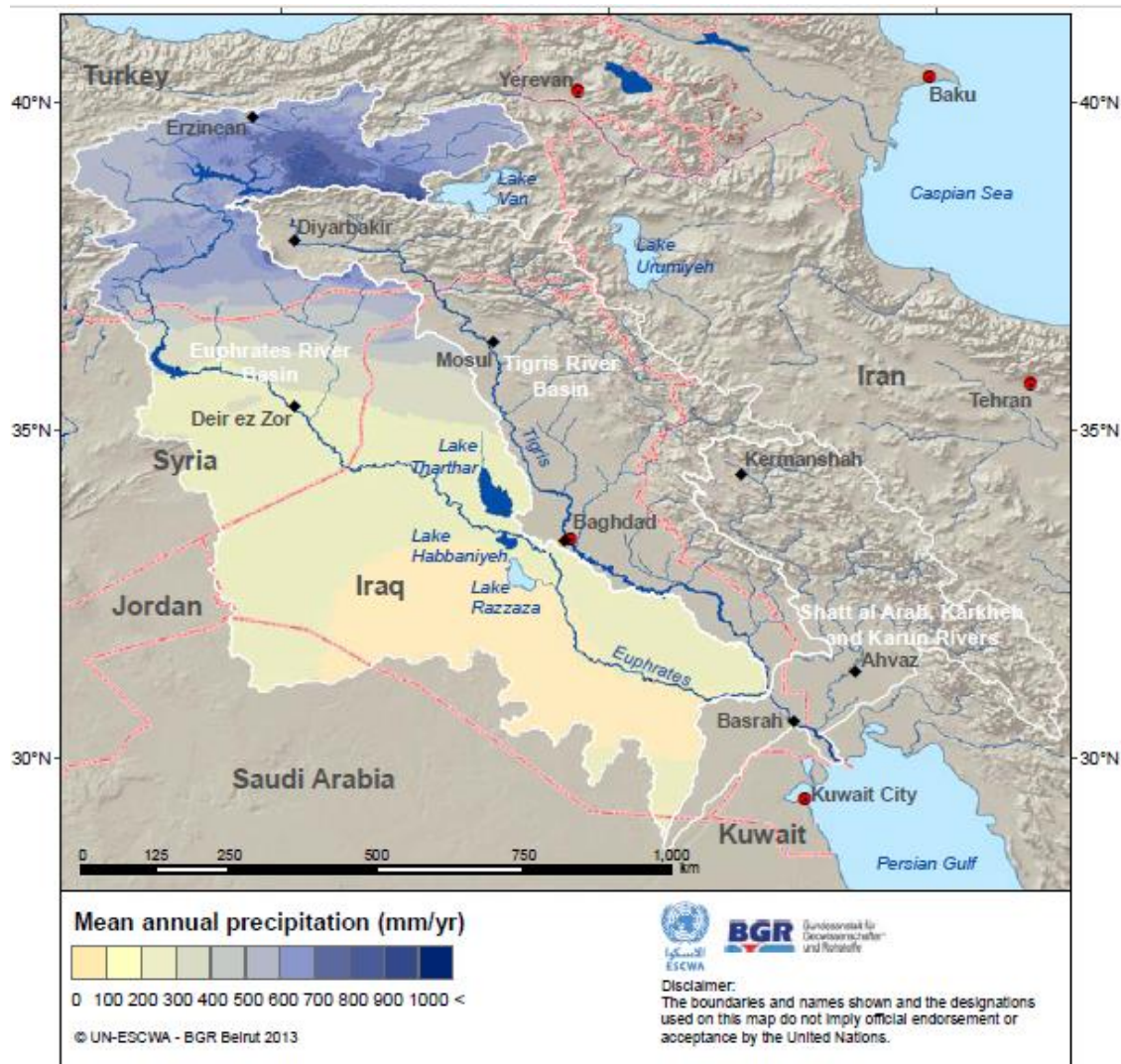


Figure 6. Mean annual precipitation in the Euphrates Basin (14).

Annual discharge variability

The discharge of the Euphrates varies annually corresponding to climate variability. The stations at Jarablus in Syria (1938-2010), Nusaybah (1981-2011), Hit (1932-1998) and Hindiyah (1930-1999) in Iraq (see Overview Map for location) have the longest available data records, covering the period from 1930 to 2011. The mean annual flow for the entire period of record is 26.6 BCM at Jarablus and 27.1 BCM at Hit. Maximum flow levels were recorded in 1969 with 40 BCM at Hindiyah, 56.8 BCM at Jarablus, and 63 BCM at Hit. This contrasts with the lowest annual flow of 3.1 BCM CVa (-) at Hindiyah in 1974, 12.7 BCM at Jarablus in 1976, and 9 BCM at Hit in 1990. (14).

Negative trend

Study mentioned in the Inventory (14) and Hydropolitics Association Applied Research Center's Study (15) reached a similar statistically significant negative trend for the period of record (1937-1973) on the Euphrates indicating a natural decrease in mean annual discharge.

After 1973 this decreasing trend has also been continued in both studies (14-15). It is also indicated in the Inventory (14) that "before 1973, the mean annual flow of the Euphrates at the Syrian-Turkish border (Jarablus) was around 30 BCM, but this figure dropped to 25.1 BCM after 1974 and fell to 22.8 BCM after 1990"

In the Inventory it is noted that "This decreasing is most likely due to climate variability and more frequent drought periods, and the construction of large dams in Turkey as part of the Southeastern Anatolia Project (GAP)." (14).

Regulating the Euphrates Flows

The Euphrates river flow regime before 1973 can be considered near natural as there was limited water regulation in the runoff-generating area in Turkey. This natural flow regime is shown in Figure 8a, with a high-flow season from March to July and a low-flow season from August to February. The increased discharge during the high-flow period was generated by snow-melt from the Highlands. Such a snow-melt regime was typical for the period of record from 1937 until the 1970s.

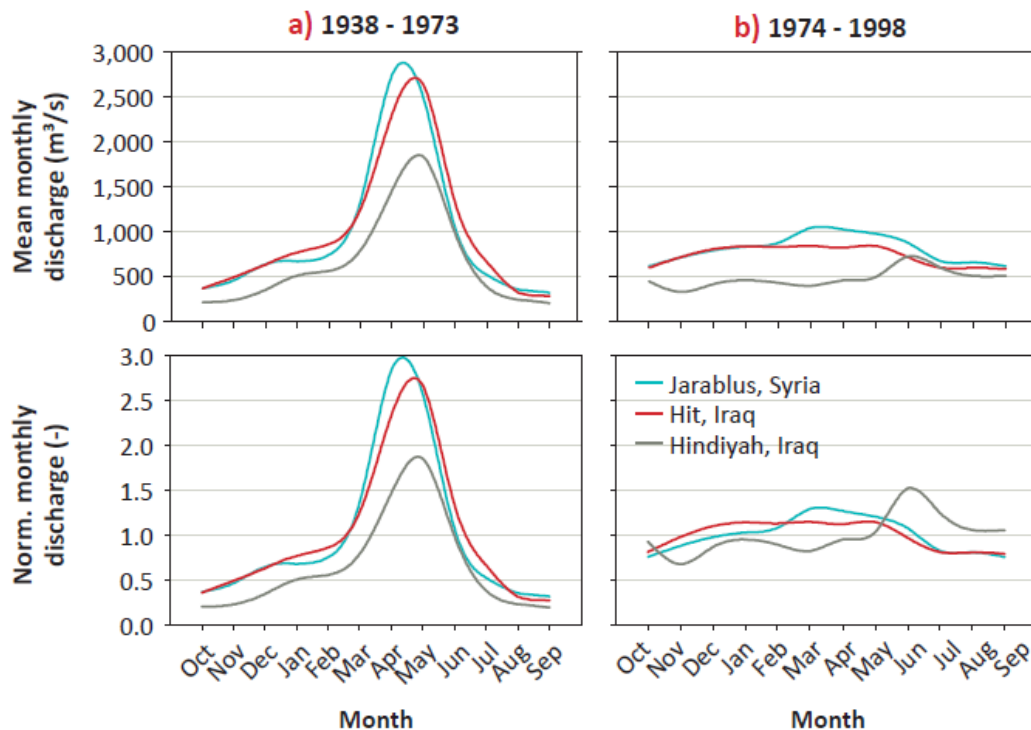


Figure 8. Mean monthly flow regime of the Euphrates River at different gauging stations for different time periods (14)

Source: Compiled by ESCWA-BGR based on data provided by the Ministry of Irrigation in the Syrian Arab Republic in ACSAD and UNEP-ROWA, 2001; USGS, 2012; Ministry of Irrigation in the Syrian Arab Republic, 2012.

The construction and operation of the Keban Dam in Turkey in 1974 and the Tabqa Dam in Syria in 1975 led to a shift in the Euphrates flow regime. Figure 8b shows that increased regulation of the naturally snow-melt-driven flow regime of the Euphrates resulted in less pronounced seasonal flow variation (1973 to 1998).

The water discharged during the high flow period from March to July was mainly stored to fill the reservoirs and released later in the year for irrigation purposes, thus artificially increasing the discharge during the low-flow season. The river was further regulated with the operation of the Ataturk Dam in Turkey in 1992 and the development of related irrigation projects.

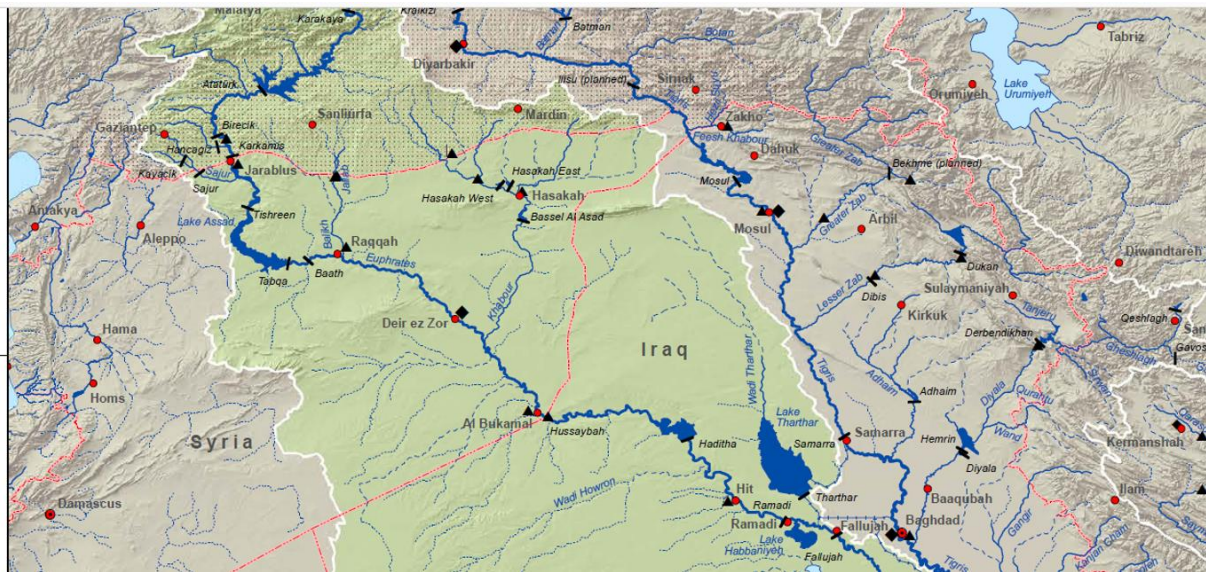


Figure7. Euphrates and Tigris River Basin (14).

How Important is the Regulating Seasonal Variability of Euphrates River?

As it is clearly indicated in Inventory (14) “The seasonal variability of the Euphrates is not suitable to meet crop needs. Water for winter crops is most needed during the low-flow season in September and October. The flood season with frequent inundations in spring puts the harvest at risk. Engineering works have therefore prioritized Euphrates stream-flow regulation in order to provide irrigation water in the low-flow season.”

3.CONCLUSION

Today, most of the world’s large rivers are dammed. The original purposes of dams were to improve human quality of life by providing drinking water and to support economic growth by diverting water for power, navigation, flood control, and irrigation

In addition to the water they provide, dams also provide energy in the form of electrical hydropower which is regarded as clean, renewable and reliable energy source.

Dams and the reservoirs they create protects growing populations from the unpredictability and violence of rivers’ seasons. In warm regions, stored floodwaters can supply enough irrigation for a year-round growing season

But the adverse effects of river impoundment-disruption of ecosystems, decline of fish stocks, forced settlements, and water-borne diseases could be listed as the possible negative effects.

To conclude, with respected to regional considerations, the need for development is obvious. The economy is almost entirely oriented to agriculture in the region. The summer drought, being very long and severe, has a negative effect on the agricultural production and the product variety. In order to reduce the burden of the region on the national economy, the agricultural production has to be increased. This can only be achieved with the development of the region's land and water resources.

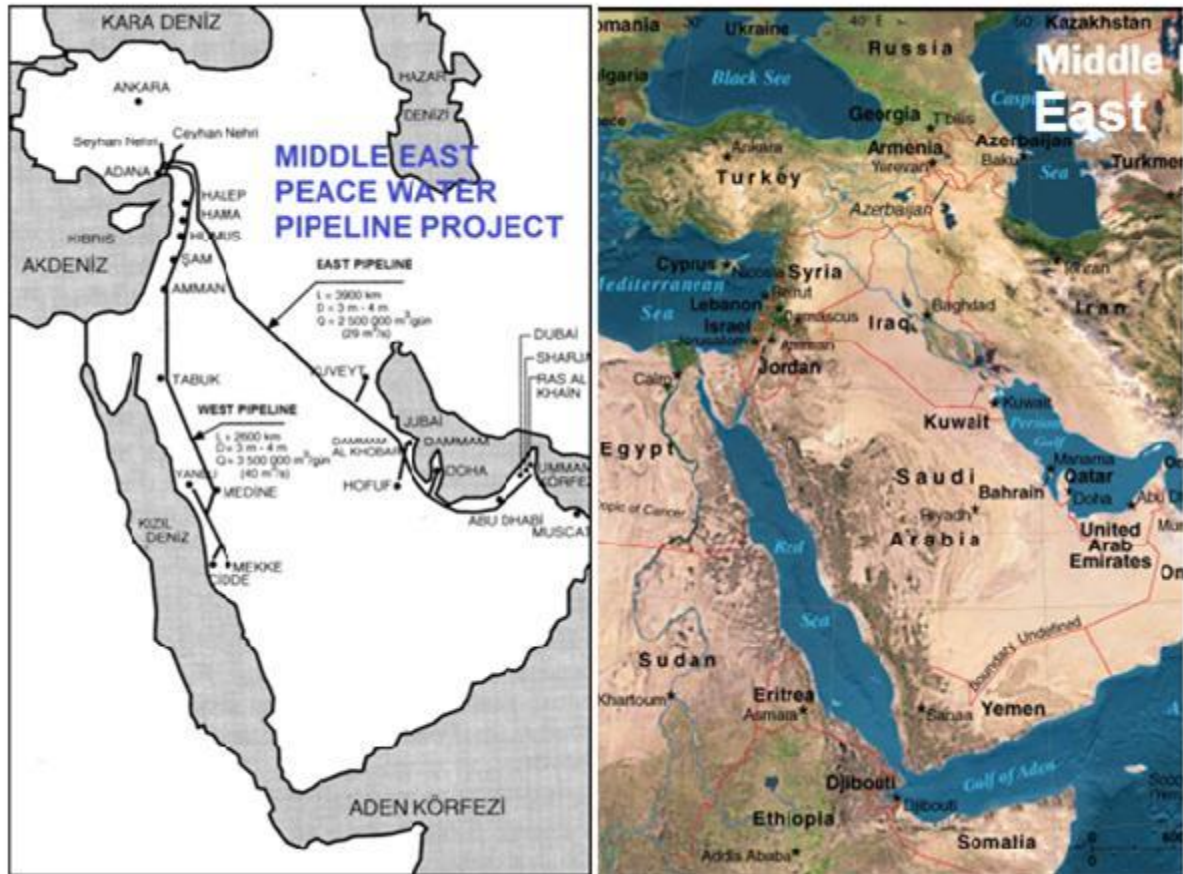
Considering the Euphrates river's dams reservoirs constructed on them in Turkey provide regular flow to the upstream countries to agricultural production. These reservoirs are regulating seasonal variability of Euphrates River providing necessary flow to downstream countries agricultural production.

An inventory prepared by UN-ESCWA and BGR (14) also includes this explanation. This approach also explains that how storing water in most suitable dam reservoirs on a transboundary river could be vital necessity in some certain cases. In addition to this, climate change adverse effect on water resources also can force the countries to store water in the most suitable dam reservoirs and use it on the base of sharing benefit approach.

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The Peace Water Pipeline and innovative hydro diplomacy



ABSTRACT

After completion of the water pipeline project to Cyprus in 2017, bulk water transfer projects to the Middle East has drawn some more attention than before. Although implementation of the Red-Dead Sea Project hasn't progressed well, the Project has been considered as an alternative for bulk water transfer in the region.

About 32 years ago in 1986, late Turkish President Turgut Özal had proposed a "Peace Water Pipeline Project" for the Middle East water problems. The Project has drawn considerable attention and caused both negative and positive reactions. Political Feasibility and financing of the project had been argued more than its technical feasibility.

Preliminary studies on the project were initiated in 1986. The ultimate aim of the Project was much beyond of the supplying some water to the countries. The Project proposal mainly aimed to create a process of confidence building and a cooperation environment on water that will help to contribute to the stability and security of the region.

During past 32 years after the Peace Water Pipeline Project proposed, water demand has increased, while the water management has been worse under the political and climatological effects in the region.

As many areas in the Middle East, Jordan is struggling with scarcity of rainfall, diminishing of water resources and increase in population. It is not certain yet if the current water management strategies and the suggested Red Sea- Dead Sea project will be enough to solve this problem. Therefore, among the other new water resources alternatives, Turkey's Peace Pipeline Project proposal can be worthwhile to be considered again with different length and route.

The Original Project would divert the water from Seyhan and Ceyhan Rivers, both national rivers of Turkey, to the Arab Countries in the Middle East. Daily water transfer capacity of the Project was 6 MCM that is only a small part of mean total daily flows of the rivers after Turkey's use.

The water would deliver through the peace pipeline is not intended to replace, but rather supplement current water supplies in the countries served. The Project had an estimated cost of US \$ 20 billion about three decades ago.

In this article, focusing on Jordan water problems, what risks and challenges associated in the region any alternative water transfer option and regional innovative hydro diplomacy is investigated.

Keywords: Peace Pipeline Project, Middle East,

1.INTRODUCTION

About 32 years ago in 1986, Turkish Prime Minister Turgut Özal had proposed a "Peace Pipeline" Project for the Middle East Water Problems. The Project has drawn considerable attention and caused both negative and positive reactions. Political Feasibility and financing of the Project had been argued more than its Technical Feasibility.

Preliminary studies on the Project were initiated in 1986. The ultimate aim of the Project was much beyond of the supplying some water to the countries. The Project proposal mainly aimed to create a process of confidence building and a cooperation environment on water that will help to contribute to the stability and security of the region

The concept of transferring water from Turkey to the Middle East, to promote regional peace and economic development in the Middle East has been a constant in Turkish foreign policy since the late President Turgut Özal in 1986 proposed an extensive 'Peace Water Pipeline'.

This was a \$ 21 billion project to bring vast quantities of water from the Seyhan and Ceyhan Rivers via two pipelines to supply the major cities in Syria, Jordan, and the Arab Gulf states. The pipelines could convey 10 million cubic meters of water every day, which was estimated as sufficient to meet the needs of 15 million persons. The original Turkish proposal also envisioned making some of this water available to Israel (9).

However, when some Arab states objected, Ankara modified its proposal, saying that Israeli participation would have to be deferred until after the conclusion of peace treaties between Israel and its Arab neighbors. It should be noted that unlike the Tigris and Euphrates, the Ceyhan and Seyhan rivers originate and flow entirely within the sovereign territory of Turkey before emptying into the Mediterranean Sea. The pipeline idea was rejected by the oil-rich Gulf states, which Turkey hoped would finance the giant project. (9).

The Saudis contended that desalination was a cheaper solution, since they could fuel flash distillation desalination plants with surplus gas produced.

The Original Project

The Original Project would divert the water from Seyhan and Ceyhan Rivers, both national rivers of Turkey, to the Arab Countries in the Middle East. Daily water transfer capacity of the Project was 6 MCM that is only a part of mean total daily flows of the rivers after Turkey's use.

The water would deliver through the peace pipeline is not intended to replace, but rather supplement current water supplies in the countries served. The Project has an estimated cost of US \$ 20 billion. It foresees the use of local materials and labor in each country on the route of the water transfer line.

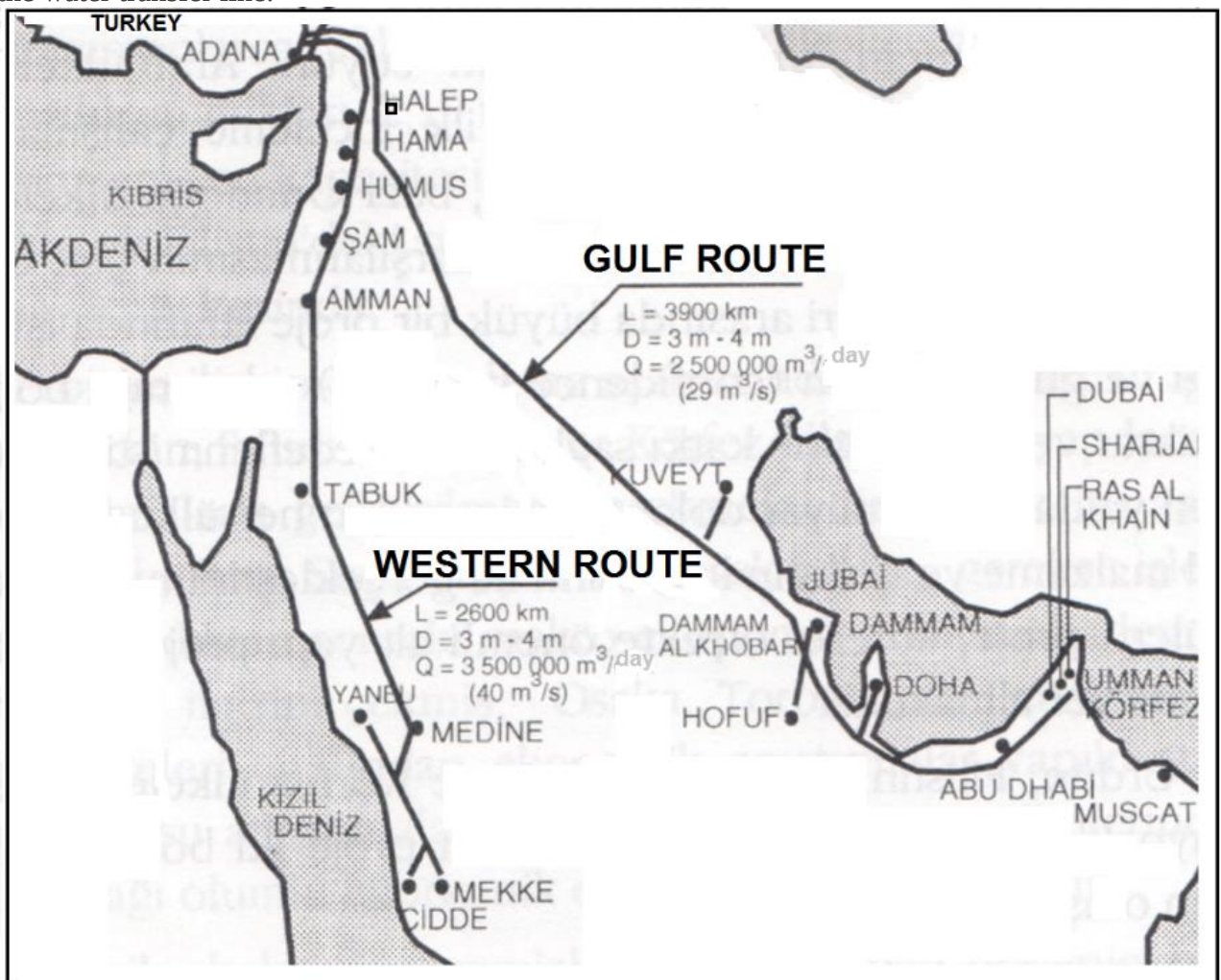


Figure 1. Peace Water Project (10)

The Project consists of two pipelines (Figure 1).

- The first one called the Western Line has a length of 2,650 km. and a Daily water capacity of 3,5 MCM. The western line ends up in Mecca via Hama, Homus, Damascus, Amman, Yanbo and Medina. According to preliminary studies made about 30 years ago the cost of 1 cubic meter of water is US \$ 0,84

- The Eastern or Gulf Line extends, after Syria and Jordan to Kuwait, Bahrain, Qatar and the United Arab Emirates. It is longer than the first one with a total length of 3,900 km. In the preliminary study, the Daily capacity and the unit cost of water was determined as 2,5 MCM and US \$ 1,07 respectively. The total investment cost of the Eastern Line is US\$ 12 Billion.

In sum, technical and economic feasibility of the Project was accepted by many experts 32 years ago. In regard to political feasibility, it had been generally argued that realization of this project would be difficult due to lack of confidence and trust among the countries over the pipeline route.

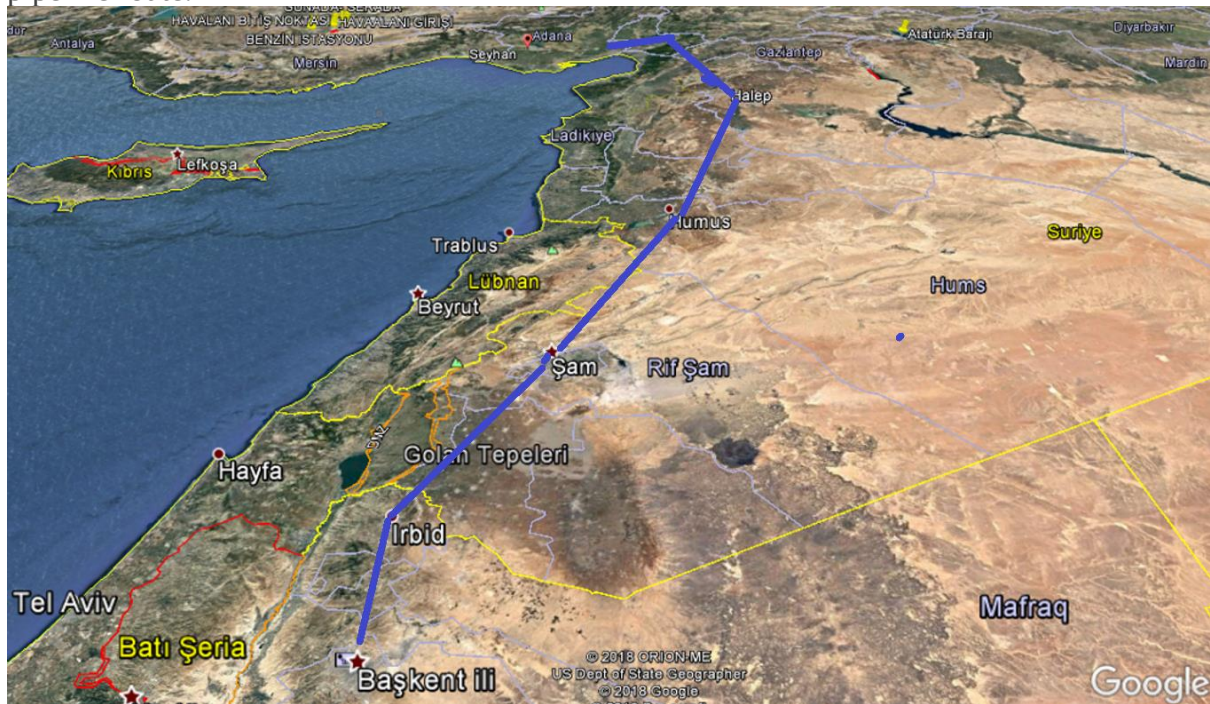


Figure 2. Shorter Eastern Line

An Alternative Proposal: Shorter Eastern Line to The Hashemite Kingdom of Jordan

Since the whole project has a rather high investment cost, better to propose that instead of extending the line to Saudi Arabia and the Gulf Countries, the terminal point could be Jordan where the problem of water shortage has emerged seriously since last 30 years.

This would also reduce cost by having a shorter line. In this case the yearly water transfer capacity will be 2,19 BCM, which is 1,6 times greater than the average annual streamflow of the Jordan River. It means that this Project could play an important role in closing the water budget deficit of Jordan.

On the other hand, the preliminary survey related to the project needs additional studies in detail considering new science and technological development that will certainly reduce the preliminary investment cost as well as operational cost.

Jordanian Current Water Challenge

Jordan is an almost unlocked, 3rd poorest in water resources, semi-dry arid and climatic zone country. Its precipitation range differs from 40 to 600 mm annually and 92% of rainfall evaporates annually (7).

According to Project titled “Management of Water Resources Programme” and commissioned by German Federal Ministry for Economic Cooperation and Development (BMZ):” With only 60 cubic meters of renewable water resources available annually per capita, Jordan is among the most water-scarce nations in the world.” (1). In the project brochure (1) the following information has also been given about current water situation in Jordan

.” The country is already confronting the effects of climate change and its resources are expected to diminish even further. At the same time, Jordan’s population is continuing to increase, and the country has also received more than 655,000 refugees since the beginning of the crisis in Syria. Factors such as these have resulted in the systematic overuse of its water resources for many years. Today the nation’s capital, Amman, relies for its water supply on groundwater resources drawn from the Disi fossil water aquifer, located some 300 kilometres to the south at the border with Saudi Arabia. If the nature and the extent of water usage are not reversed soon, the water security of Jordan’s population will be at serious risk.” (1).

In addition to hydrological drought, most of the major water resources are shared with neighboring countries, leading to additional challenges as conditions of water scarcity increase in Jordan. The increase in the number of refugees from Syria and Iraq who live in refugee camps, has led to a sharp increase in the extra water supply and wastewater problems.

In 2013, the Ministry of Water and Irrigation (MWI) estimated annual water availability at 892 million cubic meters (MCM) that about 79% of this is from renewable freshwater sources, including about 239 MCM or 28% from surface water (of which 50 MCM comes from Israel under the 1994 peace treaty agreement) and about 433 MCM or 51% from renewable groundwater. The remaining amount comes from non-renewable aquifer (fossil) groundwater (about 75 MCM or 9%) and treated wastewater (about 102 MCM or 12 %)

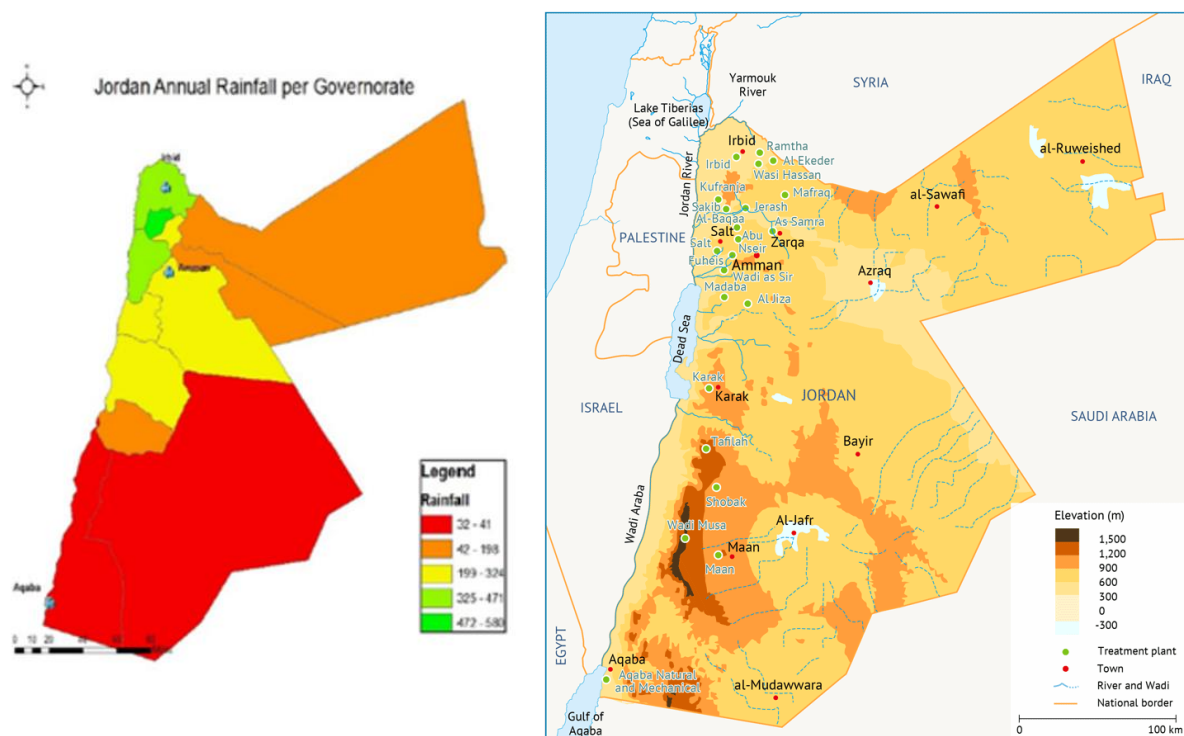


Figure 3. Jordan Annual Rainfall Precipitation and Rivers

Jordan was interested in the Project

Since Peace Water Project's initial presentation to public opinion and the parties concerned, it had received several political responses. While Jordan displayed, in general, a receptive attitude, Syria and Saudi Arabia adopted a negative one.

In early 1990's, the Jordanian Ambassador to the UN, Adnan Abu Adeh stressed the importance of receiving water from Turkey through such a Project and Dr. Jawad al Anani, the Head of Center of Economic and Technical Studies in Amman declared his organization's support for the Project (9).

What has changed for the project implementation since last 32 years

In fact, economic studies of the Project had been undertaken by the Universities of Osaka, Toronto and Pensilvania. These studies had underlined the positive impact of such a Project on development of the Middle East Countries.

Red Sea - Dead Sea project

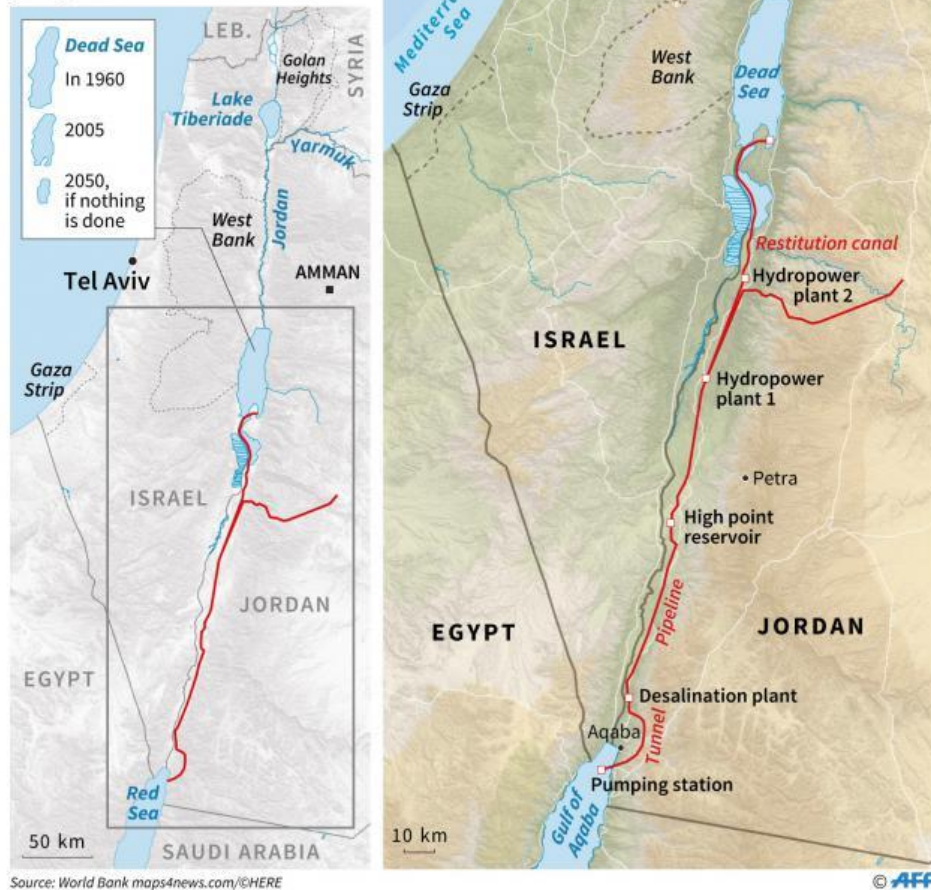


Figure 4. Red-Dead Sea Project

Technical and economic feasibility of the Project had been accepted by many experts. But the Project had been generally argued in regard to its political feasibility.

It is for sure that current political situation is worse and unstable than that of 1980's and early 2000's. Therefore, we should realize that the political feasibility of the project has also lost weight.

But on the other hand, we should also be aware of that more serious climate change effects on water resources has been experienced in the region since last 30 years. This created national security that agitating social fluctuations in Syria¹⁸ and Iraq. These emerging threats in the region may force the countries to collaborate on water management. Development a collaborative transboundary water management strategy is also important in order to maintain the regional peace and security.

On the other hand, climate change has already been effective on the Seyhan basin which peace water will be transferred. *A study carried out on "Changes and Trends in Precipitation and Air Temperature Values During the Period of 1970 and 2009 in the Seyhan Basin" (8) showed a statistically significant increase trend in the series of annual temperatures and significant decrease in the series of the annual precipitation.*

Results and Discussion

In contrast to the semi-arid climate and consequent scarcity of water that afflicts many of the countries of the Middle East, Turkey has been blessed with a relative abundance of water resources. The main problem for Turkey is the domestic one of distribution: How to bring this water to the rapidly growing cities and agricultural communities located at considerable distance from the river sources?

Turgut Özal's 1986 'Peace Water Pipeline' Project was a \$ 21 billion project to bring water from the Seyhan and Ceyhan rivers via pipelines to cities in Syria, Jordan, and the Arab Gulf States.

A shorter pipeline from the Seyhan or Ceyhan rivers to Syria and Jordan has been estimated to cost \$ 5 billion in 1986. It is clear that this Project may become feasible following the technological development since 1986.

From the point of political feasibility, the pipeline to Jordan requires a breakthrough in Syrian-Jordan and Israeli relations, including resolution of disputes over Jordan River headwaters and the Syrian Access to the Sea of Galilee (*Kinneret*).

In sum, technical and economic feasibility of the Project was accepted by many experts 32 years ago. In regard to political feasibility, it had been generally argued that realization of this project would be difficult due to lack of confidence and trust among the countries over the pipeline route.

Considering these difficulties Jordan want to go ahead with Red-Dead Water Project despite Israel's withdrawal from the Project. The amount of water demand has increased over the years, mainly due to the significant increase in population (including refugees). Jordan is consuming more water than it can secure. Political, economic, ecological and internal pressure aggravate the problem. In order to meet the growing water, demand the Government has drawn up a number of major water development plans including desalination of seawater and brackish water.

In Jordan the parties recognize that their water resources are not sufficient to meet their needs. More water should be supplied for their use through various methods, including projects of regional and international cooperation.

¹⁸ Syria had experienced three drought period since last 20 years.

Jordan is striving to balance the water deficit by utilizing new sources as well as by decreasing consumption. (12). When it is analysed, among the others this kind of bulk water transfer project seems to be the only solution to solve the water shortage problems in the long run.

While considering sustainable water resources management for Jordan, among alternative options “Turkey’s Shorter Peace Water Project” could be a regional innovative approach and a model for Regional Cooperation in the Development of Water Resources

Although it is not politically feasible now, but it is considered here to highlight regional collaborative approach need to draw attention to avoid dramatic consequences of the climate change effects on the stability of the Region.

The climatological and political uncertainties are real threats about water management in the region This is rapidly shifting towards re-enforcing water into security policies in the region (Securitization). Only a high-level comprehensive collaboration reduces a tendency towards greater securitization. This requires an innovative hydro diplomacy.

What to do for an innovative hydro diplomacy in the region are as follows;

- Demonstrate political will to manage natural resources in jointly planned projects
- A Regional approach instead of classical one
- Win win method instead of zero sum
- High level economic integration
- The process must be a continuing one
- The activities should always be ongoing in order to keep up interest
- New activities should be initiated periodically with the participation of all parties concerned

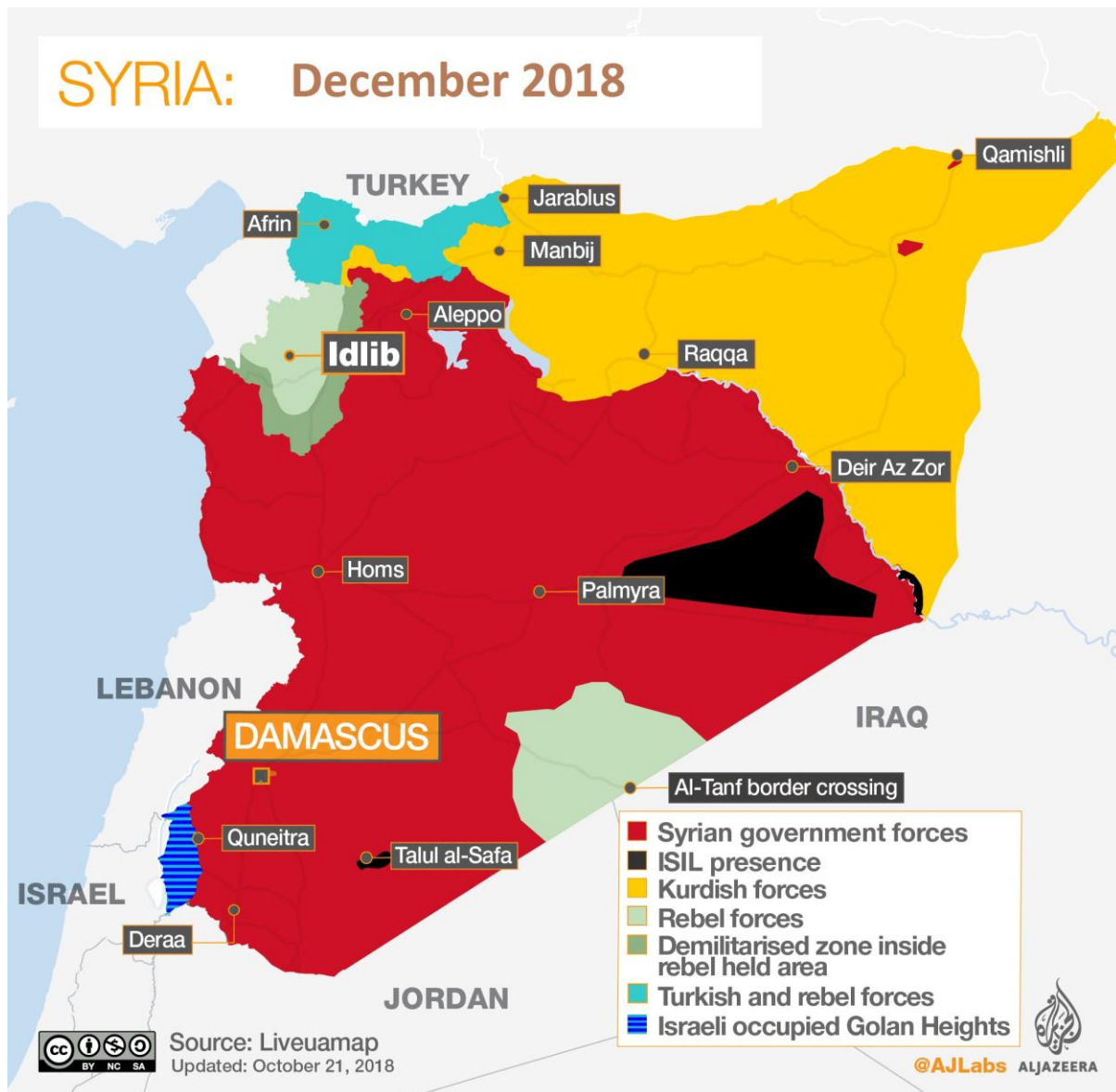
Hopefully, in the context of future peace, there will be real collaboration among the countries of the region toward achieving the provision of safe and reliable water for future generations.

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Towards Re-Securitization of Water in the New Middle East



SUMMARY

The New World Order and climate change effects may shift hydro-politics paradigm from (de)securitization to re-securitization in conflicted areas. While the world was changing in international relationships rapidly, little attention has been paid to the risk of re-securitization of some issues by related communities.

This paper first reviews possible effects of the natural climate changing trends together with consequences of the new world political changing trends on trans boundary rivers hydro-politics in

post conflicted regions. It also discusses the ongoing changing in natural climate and international political climate effects on transboundary water management in relation to securitization theory. It then unpacks the nexus water re-securitization through the prism of the national state turn in New World Order. We aim to addresses the risk of water re-securitization within the issue area of conceptualizing a New World Order emerging on the base of new national states concept.

We conduct a conceptual scoping, which critically probes what re-securitization and conflicts change politically in the conflicted regions where water was securitized while major peacebuilding efforts have been made to de-securitize the conflict in the past.

We conclude with a discussion of the risk of re-politicizing water conflict dynamics can gain momentum and threat the regional security in the water conflicted regions. It directly contradicts the normative assumption about de-securitization as a return to normal politics.

Keywords: De-securitization, Re-securitization, Water Politics; Conflict; Water conflict; New Middle East; Conflict analysis

1.INTRODUCTION

In the post-cold war period the traditional military threats, territorial integrity and state sovereignty-based security paradigm was challenged leading to the elaboration of a broader conceptualization of security.

This article discusses and amends risk of re-securitization of some issues in relation with the new international relationships and national interest politics. New international relationship and new world order concepts may permit securitization of some issues by states and some actors other than the state,

In general, the post-Cold War de-securitization of Russia and its subsequent re-securitization following the annexation of Crimea. Can be taken as a recent example. The implications of re-securitization for the emergence of a self-reinforcing security dilemma in NATO-Russia relations are also considered.

Some possible cases of re-securitization are presented and then it is evaluated from the post-Cold War securitization to possible re-securitization approach following the change in state borders and emerging conflicts potential in 21st Century.

It is obvious that technical framing of conflict tends to result in depoliticized outcomes and ignores the underlying causes of conflict. As a consequence, “new” peacemakers in the form of water experts and development brokers have specialized knowledge and thus speak with authority, but their powers are rarely assessed. The diplomats turn from peacebuilding practices may empower certain actors, who act as the harsh national interest saver while peacemakers are marginalized.

The implications of re-securitization for the emergence of a self-reinforcing security dilemma in new international relations are also worth-considered.

Therefore, it is worth nothing to draw upon two strands of research: new security architecture and transboundary water management examining below mentioned core questions:

How is re-securitization understood within the context of water conflict and what will be the influences of new security paradigm and new more nationalistic approach in resolving new water conflicts and building water peace?

2.WHAT IS THE NEW WORLD ORDER (NWO)?

The New World Order is something that various politicians and other elitists have been referring to for several years. The New World Order or NWO is claimed to be an emerging clandestine totalitarian world government by various conspiracy theories (18,19,20,21,22).

The New World order is the supposed goal of a handful of global elitists who are pushing for a one world government and a heightened national security state.

The common theme in conspiracy theories about a New World Order is that a secretive power elite with a globalist agenda is conspiring to eventually rule the world through an authoritarian world government—which will replace sovereign nation-states—and an all-encompassing propaganda whose ideology hails the establishment of the New World Order as the culmination of history's progress. Many influential historical and contemporary figures have therefore been purported to be part of a cabal that operates through many front organizations to orchestrate significant political and financial events, ranging from causing systemic crises to pushing through controversial policies, at both national and international levels, as steps in an ongoing plot to achieve world domination. (18,19,20,21,22).

Before the early 1990s, New World Order conspiracism was limited to two American countercultures, primarily the militantly anti-government right and secondarily that part of Skeptics such as Michael Barkun and Chip Berlet observed that right-wing populist conspiracy theories about a New World Order had not only been embraced by many seekers of stigmatized knowledge but had seeped into popular culture, thereby inaugurating a period during the late 20th and early 21st centuries in the United States where people are actively preparing for apocalyptic millenarian scenarios.(19,21) Those political scientists are concerned that mass hysteria over New World Order conspiracy theories could eventually have devastating effects on American political life, ranging from escalating lone-wolf terrorism to the rise to power of authoritarian ultranationalist demagogues.(19,21, 23).

2.1. The New World Order (!) and More Nationalistic Politics

International politics for most of the past quarter century was relatively straightforward. The United States reigned supreme, with no other nation coming even close economically or militarily. Under its aegis, globalization flourished, and conflicts were relatively confined in scope. Politics seemed to have become secondary.

Why any nation would want to throw out its sovereignty to institutions that are fundamentally unaccountable, that provide no mechanism for reversing direction, and whose only "solution" to problems involves arrogating to itself ever more authoritarian, rather than democratically legitimate, power. (16).

According to some experts such as Prof Michael A. Witt who is an Affiliate Professor of Strategy and International Business. **"With globalization on the ropes and a hegemon in decline, prevalent political science theories suggest a conflictual future."** (16).

While globalization is still alive, the **prognosis is not favorable**. In addition, China's re-emergence means that for the first time since the end of the Cold War, the U.S. has to contend with another player in its league. China now has the world's largest economy and its **third-most capable military**. If it grows much further – admittedly not a foregone conclusion – it may replace the U.S. as the world's predominant power.

What does this new landscape of two major Powers mean for the future of world politics? In particular, are China and the U.S. likely to rub along, albeit with some friction? Or is there a risk of major conflict or even war? (16).

2.2. Realism

Realism looks back on a long intellectual history, in **China** and the **West**. It remains the dominant paradigm of international politics today (16).

The predictions of realism derive from its view of the international system as ultimately anarchic and based on self-help. In this view, there are no credible rules that prevent other, more powerful states from seizing weaker ones. While rules do seem to exist – for instance, in the shape of the United Nations – they are seen as derivative of the power of one or several states that can ensure compliance. Sometimes this works, as in the case of the first Iraq War. Often it does not.

This means states need to be concerned with securing their own survival against outside aggression. In realist logic, survival is likely if there is a balance of power: both sides of a possible conflict are equally strong. Under the crucial assumption of rationality, neither side will attack the other under these conditions. So, survival requires building up a military strong enough to counter any threats – if necessary, with the help of allies – and an economy large enough to support the requisite military expenses (16).

2.3. Europe, USA, China, Russia

From Europe's perspective, the world in 2017 looks very different to how it looked just one year ago. But despite significant upsets resulting from elections and/or referendums, not all of the changes that are taking place are breaks from previously-trodden paths. Some are continuations of previous trends that have now become more visible or more entrenched.

One major trend, which started some 20 years ago, is the diminishing relative economic importance of advanced countries. This trend became evident around 2010, when advanced countries started to account for less than half of global GDP in purchasing power terms (17). In the case of the United States this trend emerged during the Clinton administration (1993-2001), when the question of *"what's in it for us?"* first arose in terms of *"regaining*

competitiveness". Donald Trump's victory in November 2016 seems to have made this principle into the underpinning of all the new administration's policies.

The European Union remains unsure about its role in the world, not least in terms of its security and its ability to do new trade deals. Brexit will diminish the EU's size and possibly its trade and security influence. By contrast, China's position in the world has strengthened during the last 20-25 years. President Xi Jinping's speech in Davos in January 2017 was more like that of a 'growing giant' and reminiscent of presidents' speeches calling for an open global economic system during the heyday of US hegemony. (17)

Finally, the EU remains a weaker player than its size suggests, not only because of its internal divisions but also because of its dependence on the security guarantee that the US provides and its dependence on energy imports. How and whether the EU and its member states address these two concerns is a crucial subject that goes beyond the scope of this paper.

Putin is rethinking of strategic alliances in South Asia and Moscow's role in Syrian Crisis has brought it enough support from Middle East to govern the world affairs. Russia's military power, as well as improving economic power, indicates Kremlin's growing influence on world affairs.

Often 21st century is regarded as Chinese century due to Beijing's growing relative economic power and military power. China is leasing out world's major economic corridors to access markets and it is making its grip stronger on the global arena by incorporating manufacturing industry.

3.SECURITIZATION AND TYPES OF IT

According to Oelsner (37), security is the realm where emergency measures beyond ordinary political procedures become permissible. When an issue makes it into the sphere of security because it has been successfully presented as a threat, it has been securitized. In other words, securitization is the process by which a *securitizing actor* succeeds in presenting a threat or vulnerability as an *existential threat* to a *referent object* that has a legitimate claim to survival, thereby attaining endorsement for *emergency measures*.

The emphasis on violence still allows for a wide range of threats, referent objects and actors. For instance, in the 1970s the River Paraná's water resources became a security issue between Argentina and Brazil, since both sides contemplated the violent option in order to solve the issue.

The concrete and explicit dispute was not about borders, arms balances, identities or ideologies. Rather, it simply regarded the capacity of the Brazilian dam, which was being built upstream, and whether or not it would affect Argentina's projected dam, to be built downstream.⁸ In the eyes of Argentine geopoliticians, the potential consequences of Brazil establishing the dam's capacity too high would range from floods to droughts to the spread of diseases. In the eyes of Brazilian geopoliticians, Argentines just wanted to slow down the speed of their industrial and economic growth, for which this dam was crucial (37).

If this issue were to be located in a security sector, it would be either the environmental (as it was about natural resources) or the economic sector (as the dams were for the production of

hydroelectric energy needed for industrial development). What made it a security matter—regardless of in which security sector—was that securitizing actors presented the issue as so dangerous and important that they received endorsement by the audience (in this case, political, military, and some segments of the scientific elites, since both states were ruled by authoritarian regimes that left little space for public opinion) to resort to violence, if necessary (37).

Securitization has increasingly become established within the broader and more general fields of International Relations and security studies.

Oelsner discussed the definition of security in her article saying that it is as socially constructed implies that it is not simply about a subjective perception of threats; it is not a matter that individuals decide alone, but rather has an intersubjective character. Consequently, the actual content of the concept of security is built up by the securitizing actor in a delicate bargaining process with the legitimizing audience on the grounds of facts (37).

Once these facts have been extensively perceived as existentially endangering something and have made it into the security agenda, they translate into security policy. As this argument implies, the process of securitization is mostly a domestic political choice. It is the combination of both facts and successful spreading of perceptions of threat that makes up security and becomes security policy the definition of security as socially constructed implies that it is not simply about a subjective perception of threats; it is not a matter that individuals decide alone, but rather has an intersubjective character. Consequently, the actual content of the concept of security is built up by the securitizing actor in a delicate bargaining process with the legitimizing audience on the grounds of facts.

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Trans-boundary water can be considered as a natural resource that can be easily securitized under the effect of new international politics and climate politics. According to Fischhendler (8) there are two types of security; 'strategic security', associated with the hydrology of an international river basin that links all the riparian states in a complex network of environmental, economic and political interdependencies. In cases such as these, water is often elevated to a 'national security' status- a matter of life and death. The Nile water negotiations are a case in point. The second type of securitization Mishandle (8) calls 'tactical securitization'. This takes place when 'low politics' issues, such as water, are linked with the 'high politics' issues of national survival, for example, the 1994 treaty between Jordan and Israel. Once securitization has taken place, extraordinary measures to neutralize the threat are often legitimized (8). By placing issues beyond the realm of normal politics, securitization constitutes a breach of regular political processes (26). But how is an issue, in this case water, securitized?

Water is securitized through three main mechanisms known as structural, institutional and linguistic. Structural mechanisms are physical infrastructures that serve to protect the resource

given its importance to society¹⁹. (8) However, structural mechanisms would not be justifiable without the institutional mechanisms that implement them. Institutional mechanisms may include having military representatives or foreign affairs officials in basin authorities. Finally, the centrality of language in recognizing and portraying an issue as a threat and invoking a sense of urgency, is called by Fischhendler 'linguistic securitization'. It includes metaphors, framings and narratives. Perhaps the most common metaphor is that of 'water conflict' (8).

3.1. Is international influence of the UNESCO, UN, EU, NATO, WB, WTO diminishing?

Trump's America first policy threatens to upset the global trading system and even put the WTO in danger. This will naturally precipitate reactions from other global players, and the EU and China. The EU has a strong economic and political interest in preventing the demise of the multilateral trading system (17).

The European Union remains unsure about its role in the world, not least in terms of its security and its ability to do new trade and security deals. Brexit will diminish the EU's size and possibly its trade and security influence.

Finally, the EU remains a weaker player than its size suggests, not only because of its internal divisions but also because of its dependence on the security guarantee that the US provides and its dependence on energy imports.

President Donald Trump is expected to push for deep cuts in US foreign aid including UN budget in his initial budget proposal. US was not just the driver behind the founding of the UN, but it is also the organization's biggest individual contributor - which gives the US big sway in what's happening there. This US deep cuts will also influence UNESCO Works related with transboundary water and hydro diplomacy.

US President Trump has previously been hugely critical of NATO (the North Atlantic Treaty Organization), a cornerstone of American foreign policy for more than 60 years. He attacked the organization as "obsolete" and characterized its members as ungrateful allies who benefit from US largesse.

Defense Secretary James Mattis warned NATO members in February that Washington would "moderate its commitment" if members did not meet his boss's demand that they raise their defense spending to 2% of their GDP. Mr Trump claimed his tough talk was causing the "money to pour in", although analysts point out that countries were already increasing their contributions under a 2014 agreement.

Although President Trump had a change of heart and said NATO was "no longer obsolete", his first approach has already put the NATO influence in question.

¹⁹ For example, potential threats to water systems could target infrastructures, making water systems vulnerable to terrorist attacks such as deliberate contamination. As such, a number of structural mechanisms are put in place to securitise these water systems, such as the setting up of demilitarised zones around water systems and installing early warning systems(7).

President Donald Trump plans to withdraw from the Paris Agreement on climate change, multiple outlets reported recently. This would make the United States one of just three countries outside the historic pact to reduce planet-warming emission.

Since the second world war, the US has played a clear leadership role in building, supporting and policing the global system. This sense of responsibility for maintaining the world order was supported by a view that it was beneficial to the US.

3.2. Re- securitization in context

In this study Re-securitization used as the rethinking of securitized issues and deciding to put them into securities once again, such that the securities created at the second stage represent a further securitization of securities initially created as a result of securitization.

In this article, we have argued that some countries may performs for re- securitization of some issues in response to new international relations and new global political situation. For instance, Russian action in Ukraine, the Alliance has translated successfully a securitizing move evident in discourse into concrete policy measures.

Theoretically speaking, the re-securitization has often been seen as content to describe the process of securitization rather than explain it. Our argument has been to ask ‘how’ re-securitization can bring sustainable solution in transboundary water issues and food security where climate change impacts are still matter.

Another point is “what” constitutes to protect de-securitization in conflicted areas. Therefore, the reasons for desecuritizations and driving force of resecuritisation are worthwhile to study on the base of new international relationship and climate change effects.

It is evident that emerging climate change impacts and conflicted transboundary water management issues will need more collaborative approach than that of non-effective cooperation acts, let alone re-securitization of the transboundary issues.

3.3. The (re)securitizing move

Some experts say, “the multipolar world order proved to be a total failure in maintaining global peace”. Climate change causing several problems such as sea-level rise, drought, water shortage, flood has been considered as one of the main security risks in near future. This may lead re-securitization of the water resources especially in water short regions. The rationale is that emerging national states interest in New World Order may cause re-securitization of the water resources causing tensions and even violent conflict in some regions of the World.

Through the lens of climate change politics and re-securitization theory, it seems that water-short regions of the World is likely to meet the political consequences of such security framing strategy. New emerging national security framings and their connection with transboundary water and climate change adverse effects is likely to create new conflicts in water -short regions.

Under these circumstances, it should be noted that especially transboundary water issues may become securities and it may become a political tool in international politics. Therefore, it is worthwhile to examine how and why such a strategy has emerged, and most importantly, to what extent de-securitization of water resources has been successful

3.4. The water de-securitization nexus

Another aspect of securitization, and the other side of the same coin, is *DE securitization*, or when a securitized issue is moved from the security sphere back to so-called normal politics (32).

The brief definition by Buzan et al. states that desecuritization involves ‘the shifting of issues out of emergency mode and into the normal bargaining processes of the political sphere’ (39). Yet more could be said; it implies that issues for which the potential use of force had been legitimized before, now start to retrace their steps taking the opposite direction, whereby violence ceases to be a legitimate option (37).

Although many claim that the concept of DE securitization is underdeveloped and underspecified (33), there is a growing field of studies that try to probe the securitization–desecuritization dynamic with regard to different empirical issue areas such as minority rights or ex-combatants in post–civil war settings (34,35).

In the late 1990s, there was a discursive turn in the policy framing of water, which countered the **water-war** thesis and strengthened the water-for-peace discourse. It was now argued that water scarcity was triggering cooperation rather than war. Thus, cooperation held the prospect for peace (5) and was proved by extensive historical analysis (6).

Since then, studies suggest technological and diplomatic advances, which would make cooperation a much more likely outcome of water scarcity (15, 25).

Hence, the water sector became increasingly viewed as a strategic area where cooperation was more likely to flourish between former adversaries than other issue areas. It also provided a suitable rationale for water development to become part of the liberal peacebuilding agenda in its overarching effort to strengthen institution building and state capacity. Shared functional interests in scarce water resources and technological innovations were expected to trigger and catalyze cooperation, which would create confidence and trust between warring parties. In addition, there was a tendency to overdramatize the potential dangers and risks of failing to take preventive actions in relation to water scarcity in order to mobilize and encourage investments in water development and infrastructure, such as pipelines, desalination plants, wastewater treatment and drip irrigation systems to mention a few (5).

These ideas were influenced by assumptions emanating from functionalist theory (27). The theory prescribes and expects cooperation in areas of low politics to spillover to high politics and ultimately result in integration. As Mac Ginty underlines (30),

“[a] strong logic of technocracy is to expand its area of functional competency and to make linkages with other areas of technocracy. Technocrats find it convenient to deal with technocrats.” Such a policy assumption was, for instance, reflected in the initial phases of the Middle East Peace Process where water was a prioritized area within the multilateral negotiations, aiming to foster long-term regional cooperation and sustainable peace (28,29).

As the water peace discourse dominated among practitioners and diplomats, the water sector became a favored area for donor assistance. Hydro-cooperative projects between Israelis and Palestinians were initiated and received generous funding. Many technical projects such as irrigation systems, pipelines and wastewater plants were launched and funded in Palestine to develop additional and new water supplies (36).



Yet, in contrast to other regions where water resides in the area of low politics, water in the Middle East is securitized and thereby defies some of the preconditions for functional water cooperation. This may therefore result in unintended peacebuilding consequences.

A region frequently mentioned in this context is the Middle East as it suffers from volatile politics, unfavourable demographic trends, droughts and limited quantities of freshwater (3). Climate change has added to the severity of the problem by increasing uncertainty while predicting rising temperature and decreased precipitation, which will intensify evaporation of surface water while slowing down the renewal of groundwater. This is assumed to have dire consequences on economic growth, social stability and food security (4).

A move towards ‘de-securitizing’ Egypt’s water conflict with Ethiopia or whether it is an attempt to ‘contain’ the emerging Ethiopian power, is not yet clear.

3.5. Water Resources as a national security issue.

Water resources have been identified as a national security issue in many international river basins in Southern Africa, e.g. the Okavango River basin (12), in the Tigris and Euphrates basin (13), in the Nile basin (14) and in the Mountain Aquifer shared between Israel and Palestine (15). These trans-boundary rivers are often described in terms of scarcity and embedded in concerns over ‘water wars’.

4.THE NEW MIDDLE EAST CASE

The term “New Middle East” was introduced to the world in June 2006 in Tel Aviv by U.S. Secretary of State Condoleezza Rice (who was credited by the Western media for coining the term) in replacement of the older and more imposing term, the “Greater Middle East.”

The term and conceptualization of the “New Middle East,” was subsequently heralded by the U.S. Secretary of State and the Israeli Prime Minister at the height of the Anglo-American sponsored Israeli siege of Lebanon. Prime Minister Olmert and Secretary Rice had informed the international media that a project for a “New Middle East” was being launched from Lebanon.

According to Nasiriya (38) “*The Middle East, in some regards, is a striking parallel to the Balkans and Central-Eastern Europe during the years leading up the First World War. In the wake of the the First World War the borders of the Balkans and Central-Eastern Europe were redrawn. This region experienced a period of upheaval, violence and conflict, before and after World War I, which was the direct result of foreign economic interests and interference.*”

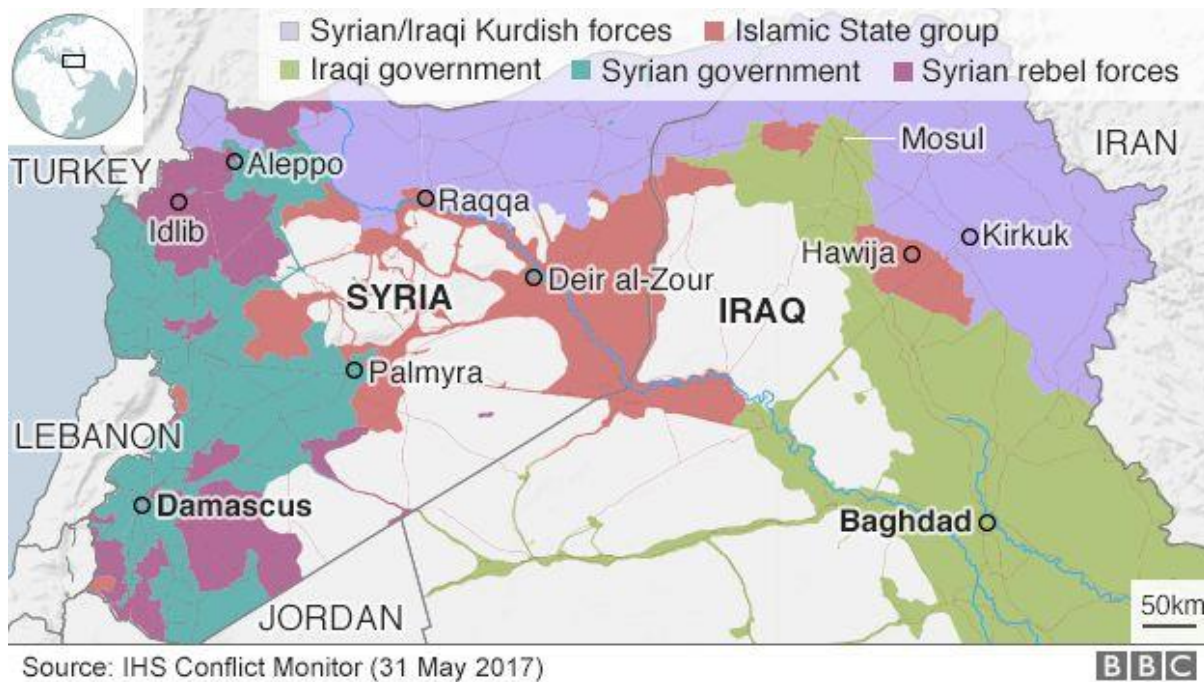
11 years ago, from now, Nazemroaya has explained that “*This announcement was a confirmation of an Anglo-American-Israeli “military roadmap” in the Middle East. This project, which has been in the planning stages for several years, consists in creating an arc of instability, chaos, and violence extending from Lebanon, Palestine, and Syria to Iraq, the Persian Gulf, Iran, and the borders of NATO-garrisoned Afghanistan.*”

He also stated in his article (38) that “*The “New Middle East” project was introduced publicly by Washington and Tel Aviv with the expectation that Lebanon would be the pressure point for realigning the whole Middle East and thereby unleashing the forces of “constructive chaos.” This “constructive chaos” –which generates conditions of violence and warfare throughout the region– would in turn be used so that the United States, Britain, and Israel could redraw the map of the Middle East in accordance with their geo-strategic needs and objectives.*”

Although it is extremely important that security, stability and development through political dialogs and negotiations set up between regional states, upcoming collapse of Syria after six-year civil war, almost divided Iraq and newly emerging Qatar crises indicates that these dialogs and negotiations will be delayed for a certain period of time as usual in the region.

The results of constructive chaos and new announcement of the Kurdistan Regional Government of Iraq about independence referendum date as Sept 25, 2017, parliamentary elections date as Nov 6, 2017 show that as a first stage, redrawing the map of the Middle East mission has already been completed. But second and third stage of the mission to set up a temporary balance in an imbalance seems to be very difficult and take a long time.

During these stages, re-securitized resource politics (water and oil) seems to play very important role for the future of the new Middle East.



Therefore, in this section we will attempt to touch upon some of the issues involved so as to shed light on the various ways water has been securitized in the region.

It is worthwhile to examine the re-securitization in the Tigris-Euphrates River basin and the Orontes River basin. Given the arid or semi-arid nature of the region, the very survival of the states in question is dependent on their having access to these rivers.

In these cases, competition for water among the riparian states is aggravated by political conflicts.

Water was and remains a highly securitized issue in the Tigris-Euphrates basin. Both Syria and Iraq had resorted over the decades to various securitization mechanisms with regards to their water conflict with Turkey, whereas the latter mostly resorted to ‘contain’ these securitization moves via the use of ‘soft power’. However, in January 1990 Turkey mobilized its forces when it cut the Euphrates to fill the Atatürk Dam, reducing the flow of water into Syria and Iraq by 75 percent. Iraq had threatened to bomb the dam, which led Turkey to threaten to cut off the water flow to Syria and Iraq completely.

Both Syria and Iraq resorted occasionally to strategic securitization through framing their conflict over water in terms of regional security and thereby mobilizing regional and international support for their cause. Moreover, Syria resorted to tactical securitization by linking low politics issues (water) with high politics (the Kurdish issue) (7).

However, the “High Politics” of the region has discouraged cooperation and collaboration between the parties in the region and transboundary water politics among Turkey, Syria, and Iraq improved markedly in the first decade of the 2000s (9). In 2005, a track-two initiative (the Euphrates-Tigris Initiative for Cooperation (ETIC)) was set up, and in 2008, the co-riparian agreed to create a joint water institute. In 2009, Syria and Turkey also agreed to build a joint dam on the Orontes River, another transboundary watercourse in the region. Although this so-called ‘Friendship Dam’ has been described as ‘a breakthrough in Turkish-Syrian hydro

politics' (9), no tangible achievements were realized. In 2009 a 'crisis summit' was held in Ankara to discuss the water issues and the drought that hit the region.

Israel and Palestine both link their respective highest-order goals; security and national rights, with unfettered allocation of water. Securitization of water resource management; linking water issues to national security concerns, dominates long-term planning in Israel and is the foundation of Palestinian national aspirations.

4.1. New Middle East, New Conflicts, New Water Equation

The transboundary water problems in the Middle East is not limited to water quantity and quality anymore. It is prone to intricately intertwined into the political fabric of the region

Much has been written about the most secure and economic route of the oil and natural gas pipelines and, while it has not been another vital natural resource can be securitized easily under the effect of political and natural climate change in the New Middle East. As it is well known, transboundary water sources have constantly been part of the discussion among military and political strategists in the Middle East.

New Middle East and Climate Change will force to set up a new water equation for this water short region. The region is largely arid or semi-arid with precipitation rates of 250 mm/annually in most of the region compounded by extremely high evapotranspiration rates ranging from 1700-2300 mm/annually. Finally, the spatial considerations of water distribution and lack of holding capacity, in conjunction with high population rates, exacerbate the crisis.

4.2. Transboundary Groundwater

There are few precedents in international law relating to trans-boundary groundwater management.

While the Helsinki treaty of 1966 prescribed (in a nonbinding fashion) a doctrine of 'hydrologic unity', i.e., users need to be reasonable and equitable when drawing groundwater, the Bellagio treaty of 1989 provided some guidelines to protect groundwater from excessive 'drawdown' and the Harmon Doctrine provided for some measure of water 'rights', for the most part, the vast history of legal decisions regarding water management relate to surface water. Moreover, most of, many of legal renderings deal with water 'needs' and not 'rights. (6).

Transboundary groundwater issues in the new Middle East will also likely to be a more conflicted than before

5.CONCLUSION REMARKS

This paper first reviews possible effects of the natural climate changing trends together with consequences of the new world political changing trends on trans boundary rivers hydro-politics in post conflicted regions.

It seems to be worthwhile to synthesize emerging more national interest based new international relationships effects on transboundary water issues within the context of countries' policy goals.

The potential unifying power that a trans-boundary water resource provides to increase the sharing of benefits, deepen dialogue, and thereby assist in economic (environmental and security) development. Especially in the conflicted regions in the world, water resource management is an indirect variable of the peace process; albeit a critical vector with a great deal of potential for “spill over”. Water resource management, on the other hand, is a direct and vital variable for economic sustainability.

In her article (37) Oelsner highlighted that mutual trust and confidence as central elements in stable regional relations. The emergence of trust and confidence amongst states marks the transformation of zones of *negative peace* into zones of *positive peace*. Moreover, if civil societies are so closely interconnected that in addition to their national identities some kind of regional identification emerges, then that zone of *stable peace* has also become a *pluralistic security community*.

Desecuritization encourage improvements in the quality of regional peace. Nonetheless, it is also thinkable that regional peace stabilization—as the result of the mere passage of time without armed confrontations; that is the transformation from fragile into unstable peace—may slowly encourage domestic desecuritization (37). Opposite to this approach

The process peace stabilization and consolidation are demanding, fragile, easily reversible, and needs a great deal of political will. In contrast, securitization and destabilization of peace are a likely outcome in the anarchic context, particularly in the case of former adversaries.

But, While the World is moving towards a new world order and national interests of the countries are gaining momentum, re-securitization of the water resources especially in a politically new designed region like Middle East wouldn't be so much surprising issue.

In the New Middle East, a major obstacle to reach an agreement on this on-going water conflict would be ‘national security’. The new states or federal states or cantonal new entities in the new Middle East will try to justify their water policies by linking ‘water security’ with ‘national security’. This attempt could bring the re-securitization of the water to the region in a new form causing new conflicts in the region.

Hence, it seems reasonable to claim that (de)securitization and regional peace is closely interlinked. Therefore, it is wise to defend to de-securitize to water resources in conflicted regions with the help of participation and involvement of the national and international civil society and related organizations.

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Current Hydro Logics and Hydro Politics over Ilisu Dam

Turkey wants to fill the Ilisu Dam Reservoir

SUMMARY

Turkey has stopped filling the Ilisu dam on the Tigris River to help Iraq overcome water shortages, but it will resume filling the dam on July. Turkey stated that once the filling starts again, water will still flow into Iraq in accordance with agreements between the two countries. Turkey had previously delayed the date to start filling the dam from March until June on Iraq's request.

The Ilisu Dam is located on Tigris river and it is about 45 km from the Syrian-Turkish border. It will be the largest hydroelectric power plant in the Southeastern Anatolia Project (GAP) with a hydropower capacity of 1,200 MW, producing an expected 3,800 GWh/yr. With a planned height of 135 m, the dam will have a 10.4 BCM reservoir.

The controversial Ilisu Dam Project has raised concerns among a wide range of stakeholders including the main Tigris riparians, local residents and international nongovernmental organizations. International consortium of export credit agencies were heavily criticized by several environmental and human rights groups to stop financial support to the Ilisu Dam.

Critics of the project claim that the region's cultural heritage will suffer irreparable damage with the flooding of the ancient city of Hasankeyf and neighbouring areas and the involuntary resettlement of about 50,000 people, while at the same time causing further environmental damage to the Mesopotamian Marshlands.

Ilisu Dam Construction began in August 2006 but was interrupted two years later because of cancellation of international funding support. Determined to see the project through, Turkey sought other lenders, both domestically and abroad.

Climate Change effect on water resources political uncertainties and Ilisu dam reservoir filling period will shape a new hydro logics and hydro politics in the region.

Apart from Ilisu Dam's negative consequences on environment and cultural heritage, in this article, we aim to focus on hydrological and hydropolitical effects of the Ilisu Dam in the basin.

Keywords: Ilisu Dam, Hydropolitics, Tigris River, Real Water Diplomacy,

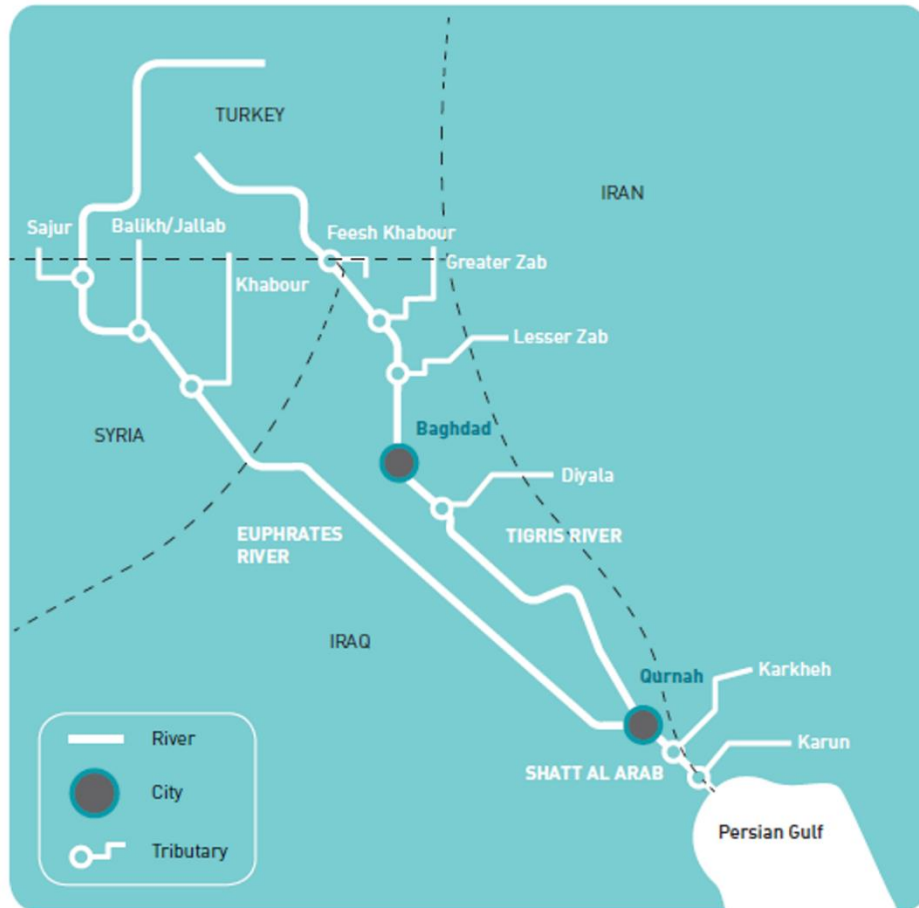
1. INTRODUCTION

Hydrological Characteristics

The Tigris River waters mainly originate in Iran, Iraq and Turkey. Syria does not contribute any significant discharge to the river. In the absence of measured water balance data, riparian

contributions are expressed as ranges: upstream Turkey contributes an estimated 50 % of the river's annual discharge, Iraq 40%, while Iranian headwaters and tributaries are estimated to contribute 10% to Tigris river flow.

Figure 1. Sketch of the Mesopotamian river system



Source: Compiled by ESCWA-BGR.

The length of the Tigris was calculated by tracing the Butan from its source to the confluence of the Tigris with the Euphrates. Different literature sources establish the length of the river at 1,850 km²⁰ and 1,718 km²¹. While the Tigris headwaters lie in Turkey, most of its tributaries originate in Iran and join the Tigris in the Iraqi Lowlands. The Tigris has a higher water yield than the Euphrates River. Historically, the natural annual flow of the Tigris at the Iraqi-Syrian-Turkish border was around 21 BCM. Flow contribution to the mean annual flow volume of the Tigris from tributaries located between Mosul and Kut amount to an estimated 25 BCM²². In

²⁰ Kibaroglu, 2002a; Kliot, 1994b; FAO, 2009.

²¹ Shahin, 2007; Al-Ansari and Knutsson, 2011.

²² Including mean annual flow volume of the Greater Zab (12.7 BCM), Lesser Zab (7.8 BCM) and the Diyala River (4.6 BCM) according to data provided by USGS, 2012; Ministry of Water Resources in Iraq, 2012. See

the literature these contributions are often referred to as significant, accounting for 50% of the Tigris flow in Baghdad²³ (Figure 1).

Flow Regime and Annual Discharge Variability

The Tigris river flow regime can be considered natural before the 1970s, with limited water regulation in the runoff generation area in Turkey, Iran and Iraq upstream of Mosul. This natural flow regime shows a high-flow season from February to June and a low-flow season from July to January. The increased discharge during the high-flow period is typically generated by snow-melt and increased precipitation in the Turkish and Iraqi-Iranian mountains.

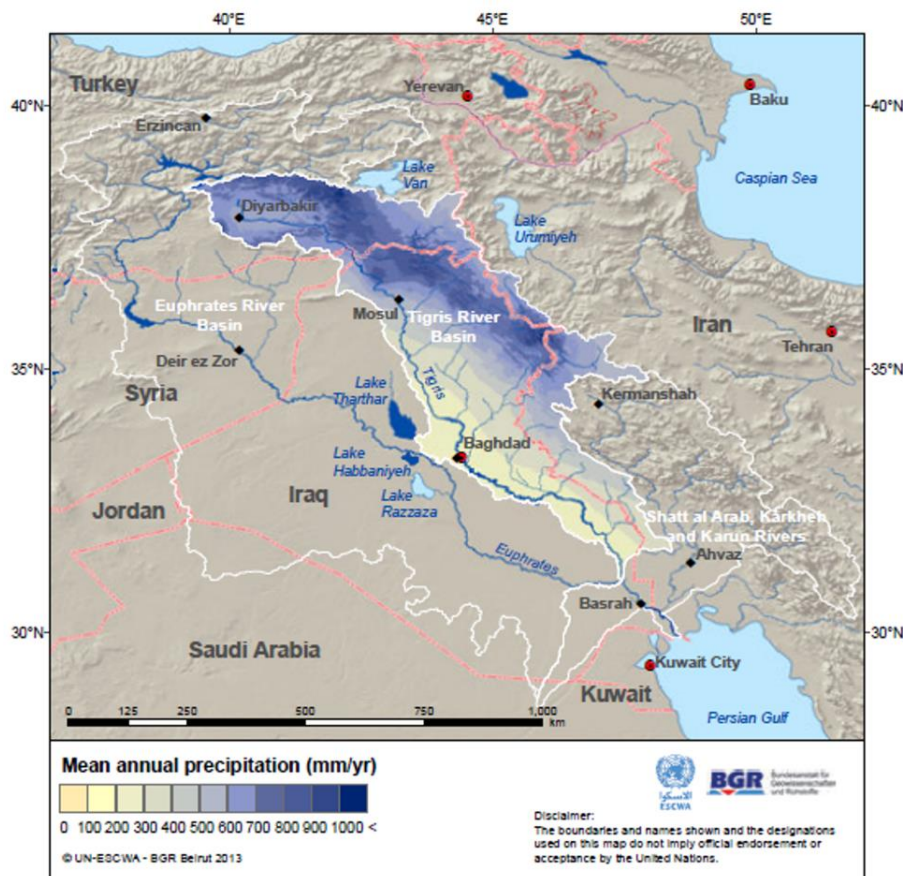


Figure 2. Main Annual Precipitation in the Tigris Basin (1).

Such a rainfall/snow-melt regime was typical for the 1931-1973 period of record at Mosul and farther downstream at Kut. Compared to the Euphrates flow regime, the Tigris high-flow season is much longer and more pronounced due to higher winter precipitation over a much greater basin area.

Chap. 4. 14. Including mean annual flow volume of the Greater Zab (12.7 BCM), Lesser Zab (7.8 BCM) and the Diyala River (4.6 BCM) according to data provided by USGS, 2012; Ministry of Water Resources in Iraq, 2012. See Chap. 4.

²³ Kliot, 1994a; Shahin, 2007; ACSAD and UNEP-ROWA, 2001.

The gradual melting of snow cover in the headwater region of the Tigris River and its tributaries helps to maintain water levels. Peak discharge in the Tigris Basin generally occurs in April, a month before the peak of the Euphrates

River. One study based on measurements from Iraq claims that the March-May high-flow season accounts for more than half of the mean annual flow volume of the Tigris²⁴

Available flow data for the Tigris River covers the period 1931-2011 and comes from the Mosul and Kut gauging stations. The records for the station at Mosul represent the river's natural flow after crossing the border between Turkey and Iraq as no dams were built on the Turkish stretch of the Tigris until the 1990s.

During the second period from 1974 until 2005 major water infrastructure projects were implemented in the basin, though the Tharthar Dam was already built in the 1950s.

The mean annual flow for the entire period of record is 20 BCM at Mosul and 25.7 BCM at Kut.

2. WATER RESOURCES DEVELOPMENT IN THE TIGRIS RIVER BASIN

Iraq has a long history of water use in the Tigris Basin and was also the first riparian to develop irrigation projects, and construct dams, barrages and cross regulators on the river and its tributaries. Early engineering projects launched in the 1940s focused on hydroelectric power production and support for irrigated agriculture in the lower parts of the basin.²⁵

In the mid-1970s, Iraq irrigated approximately 5.6 million ha of land, of which almost 70% (3,825,000 ha) were located in the Tigris Basin²⁶. The river currently irrigates around 4 million ha of land in Iraq²⁷.

Iraq has also built a diversion projects on the river, cantering on the Thrasher Canal between the Euphrates and Tigris.

Syria is a minor Tigris riparian as the river defines only a short stretch of the Syrian-Turkish border. The country only exploits the basin's water resources for small-scale agricultural activity and domestic use.

However, in mid-2010, Syria launched the first phase of an irrigation project on the Tigris River.³⁴ The project is based on a 2002 agreement between Syria and Iraq, which authorizes Syria to pump an annual 1,250 MCM from the Tigris River²⁸. The water is to be used to irrigate approximately 150,000 ha of land in Hasakah Governorate in the upper part of the Khabour Basin through an interbasin water transfer²⁹. The project also aims to generate hydroelectricity and strengthen the local economy by improving agricultural yield³⁰.

²⁴ Beaumont, 1998, p. 169; Isaev and Mikhailova, 2009, p. 386 state that from March until August-September, the flood season accounts for 56%-75% of annual Tigris runoff.

²⁵ Öziş Ü. 1983, p. 343.

²⁶ Al-Sakhaf in Isaev and Mikhailova, 2009.

²⁷ ACSAD and UNEP-ROWA, 2001, p. 99.

²⁸ Ministry of Irrigation in the Syrian Arab Republic and Ministry of Irrigation in Iraq, 2002.

²⁹ IFAD, 2009.

³⁰ Ministry of Irrigation in the Syrian Arab Republic,

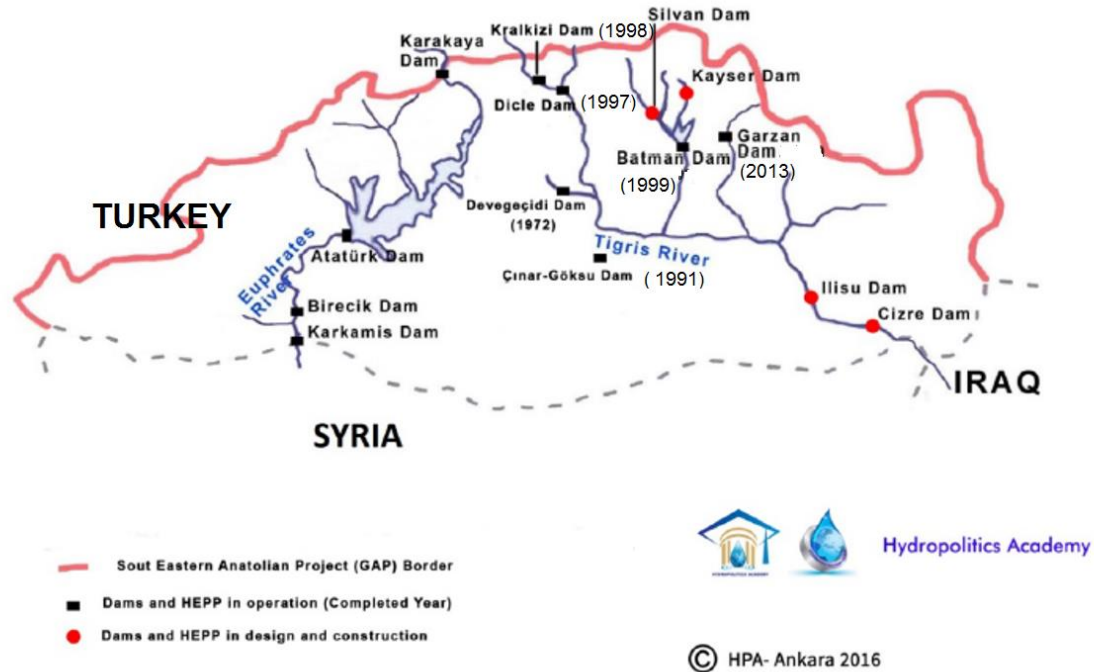


Figure 3. Operated and planned dams in the upper Tigris Basin in Turkey (4)

Turkey has started to make more use of the Tigris in recent years and has built six dams and hydroelectric power plants on the Tigris River.

“Western Tigris Development Plan”³¹ also aims to establish a reservoir system on the upper Tigris River for flow regulation. The Ilisu Dam Project lies at the heart of this system, with a hydroelectric power generation capacity in the range of 1,200 MW.

The Ilisu Dam is assumed to substantially attenuate floods and increase seasonal low flows³²

3. STEPS FOR COOPERATION

At the Joint Economic Committee meeting in 1980, Iraq and Turkey set up a Joint Technical Committee (JTC) for Regional Waters to determine how they would allocate a reasonable amount of water to each country and exchange data³³. In 1983, Syria joined JTC, creating a trilateral forum.

2010.

³¹ For more information on the first projects on the Tigris see Ozis, 1983.

³² Ilisu Environment Group, 2005.

³³ The idea of JTC dates back to 1946 when experts from Iraq and Turkey met to discuss flow guarantees on the Euphrates (see Chap. 1). The committee was subsequently established based on a Turkish-Iraqi Joint Economic Committee meeting protocol.

The work of the JTC experts focused mainly on the Euphrates River rather than the Tigris. After 16 meetings, JTC came to a deadlock in 1992 over the question of whether the Euphrates and Tigris Rivers constitute a single system or not.

Since 2004, a number of meetings have been convened at ministerial and technical levels, indicating a thaw in basin relations. For instance, relations between Syria and Turkey played a crucial role in advancing the current

Syrian project on the Tigris, with construction only starting after Turkish approval was secured. Iraq and Syria then experienced a remarkable rapprochement in recent years, with reciprocal visits leading to a number of agreements, mainly on economic cooperation and security issues.

There is no basin wide agreement in place that includes the four Tigris riparian or that allocates Tigris water resources among the four riparian. Besides a 2002 agreement between Syria and Iraq, there are no bilateral agreements that deal exclusively with the river.

The 2002 agreement is also the only one to address water quantity issues in the Tigris Basin. The agreement allowed Syria³⁴ to establish a pumping station on the Syrian side of the river. After Turkish approval in 2009³⁵, Syria launched the project, which aims to withdraw 1,250 MCM annually from the Syrian part of the Tigris River (provided that the river's flow is average) and irrigate an area of 150,000 ha³⁶.

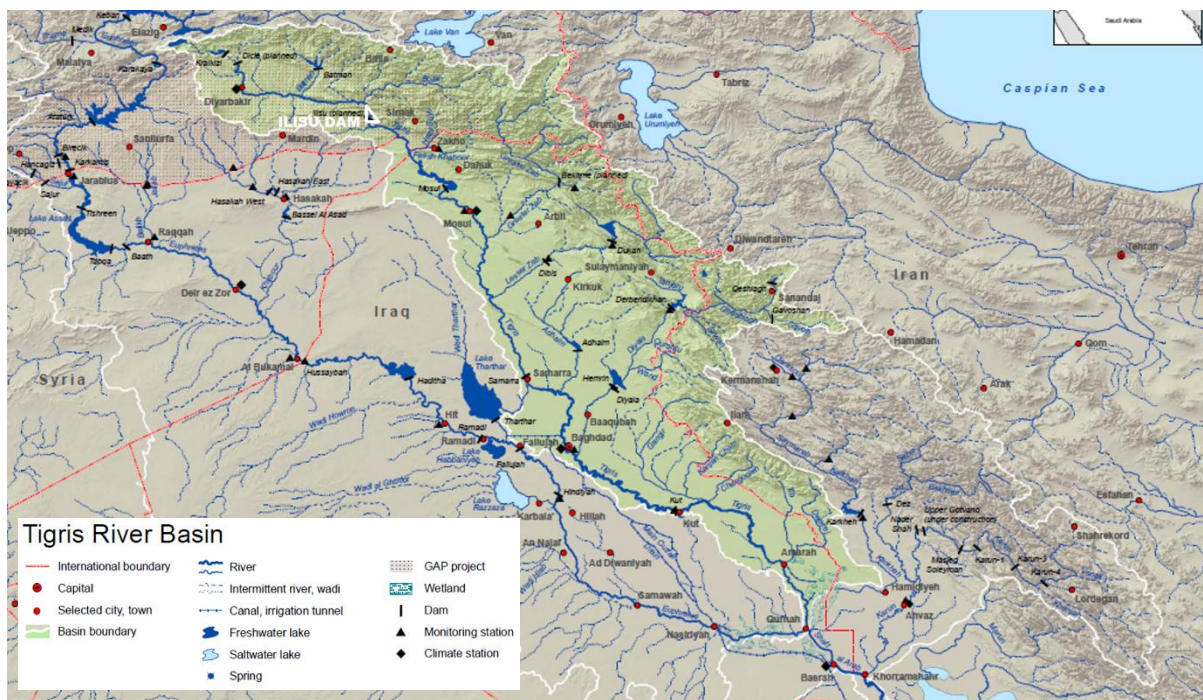


Figure 4. Tigris River Basin (1).

³⁴ According to the Syrian Ministry of Irrigation, the Tigris defines the Syrian-Turkish border for 39 km and the Iraqi-Syrian border for 5 km (Daoudy, 2005, p. 65).

³⁵ Droubi, 2010.

³⁶ Ministry of Irrigation in the Syrian Arab Republic and Ministry of Irrigation in Iraq, 2002.

4. KEY CONCERNS IN THE BASIN

- **CLIMATE CHANGE:** Water use for irrigation and hydropower production is constantly increasing, with numerous operational and planned projects along the river's main course and its tributaries placing pressure on flow regimes in the basin. Climate Change and periodic droughts affect water supply and may impact water allocation to different sectors in the future.
- **NO AGREEMENT & DISPUTES:** There is no basin-wide agreement and no common approach or consensus on how to regard the Euphrates and Tigris Rivers. While the development of new infrastructure along the river course has in general not sparked disputes among basin countries, the Ilisu Dam Project in Turkey remains controversial. Iran's damming of the Wand River has also caused tensions between Iran and Iraq.
- **WATER QUALITY:** Water quality is relatively good in the upper part of the basin, but salinity levels increase in the Iraqi part of the basin. Rising pollution from domestic and industrial sources is a cause for concern.
- **BIODIVERSITY:** The Mesopotamian Marshes have suffered severe damage as a result of upstream damming projects in the 20th century, reducing the marshes to 14% of their original size. More than half of the original area of this unique freshwater system has recently been rehabilitated in a joint effort by the Iraqi Government and international organizations.

Flow Decreased

River runoff is currently controlled by several dams in Turkey, Iraq, Iran with more dams under construction and in planning stages may have led to a reduction in flow volumes farther downstream,

According to the New Eden Master Plan for the Sustainable Development of the Iraqi Marshlands there is also a significant difference between pre- and post-1990 measurements in terms of annual flow volumes. The natural Tigris water regime has been affected by the construction of large water control structures in Iraq, Iran and Turkey. This has in turn impacted the ecosystem of the Mesopotamian Marshlands in Iraq, which depend on regular high flows and floods. Before 1990, annual water availability in the Mesopotamian Marshlands was estimated at 47.5 BCM. After 1990, this figure dropped to a maximum of 24 BCM, with minimum flows of 4.2 BCM recorded in 2001 (1).

5. CURRENT HYDROPOLITICS OVER THE ILISU DAM

In fact, we could say that hydropolitical relations between Turkey, Iraq have been less problematic than Euphrates Rivers hydropolitics. Main reason of this Turkey as an upstream country hasn't developed their water resources significantly in the upper Tigris basin until 1990's.

Apart from historic agreements that jointly address the Euphrates and Tigris Rivers, water resources in the Tigris Basin have not received much attention at the negotiation table. There is no basin-wide agreement in place, and the Tigris River has been the subject of only one bilateral agreement.

Syria is a minor Tigris riparian as the river defines only a short stretch of the Syrian-Turkish border. The country only exploits the basin's water resources for small-scale agricultural activity and domestic use.

However, in mid-2010, Syria launched the first phase of an irrigation project on the Tigris River³⁷. The project is based on a 2002 agreement between Syria and Iraq, which authorizes Syria to pump an annual 1,250 MCM from the Tigris River³⁸. The water is to be used to irrigate approximately 150,000 ha of land in Hasakah Governorate in the upper part of the Khabour Basin³⁹ through an interbasin water transfer⁴⁰.



Photo 1. Ilisu Dam

In June 2, 2018, Iraqi Minister of Water Resources Hassan Al-Janabi said there are no fears of lower level of water flow in the Tigris River. He added in a press conference that the level of water in most areas of Iraq decreased because of “natural scarcity of water” due to insufficient snow cover and rain.

According to Al-Janabi, communication channels are being opened between Iran and its neighboring countries and the decrease of water would not affect those relations. He also stressed that further discussions are needed with neighboring countries. Trying to relieve the

³⁷ Also referred to as the Khabour River Basin Irrigation Development Project

³⁸ Ministry of Irrigation in the Syrian Arab Republic and Ministry of Irrigation in Iraq, 2002.

³⁹ The Khabour is a sub-basin of the Euphrates Basin.

⁴⁰ IFAD, 2009.

people, the minister said that Iraq has enough drinking water and enough water for irrigation for hundreds of thousands of square kilometers of land.

Al-Janabi further said that his country has an agreement with Turkey regarding the amount of water for the dam's reservoir and the quantity to be launched, adding that an Iraqi delegation would visit Turkey soon to discuss the matter with Turkish officials.

Turkey's ambassador to Iraq, Fatih Yildiz, said that his country started filling the reservoir after consultations with the Iraqi side, and hosted an Iraqi technical delegation to check the dam. He stressed that his country would not take any step without consulting Iraq, as Turkey believes that Tigris–Euphrates waters are mutual waters.

Second time Turkey delayed filling the Ilisu dam on the Tigris River to help Iraq overcome water shortages, but it will resume filling the dam on July. Turkey stated that once the filling starts again, water will still flow into Iraq in accordance with agreements between the two countries. Turkey had previously delayed the date to start filling the dam from March until June on Iraq's request.

Filling of the reservoir of Ilisu dam will take about one year and the level of the Tigris River will visibly drop. But Turkey reported that "Iraqis have nothing to fear from the filling of an upstream reservoir on the Tigris River, saying "sufficient quantities of water" would continue to flow to the neighboring country.

Iraq's Minister of Water Resources has nevertheless sought to downplay fears of drought, saying there will be enough water for drinking and for half the normal summer irrigation. Hassan al-Janabi told that there had been an "unfair and organized defamation campaign to spread panic among Iraqis." He said Iraq and Turkey reached a "fair" agreement whereby Turkey will release 75 percent of the river's volume while keeping the rest to fill the dam over the next six months. He said the two sides are set to meet again on Nov. 1. However, when asked about it at the press conference, the Turkish ambassador denied any agreement had been reached.

Iran, as a riparian state is also in the Tigris Water Equation in the Middle East. The recent shortages have also been blamed on dams built on tributaries in neighboring Iran.

6.CONCLUSION

In fact, characteristics of the Tigris River Hydropolitics is not comparable with the Euphrates River's one. Because of that development of the Tigris water resources has begun from the lower part of the basin in Iraq. Turkey as an upper basin country has started to develop Tigris River much later than Iraq in 1990's. Iran has decided to develop its dams' constructions in tributary of Tigris River in 2000's.

In addition to this, range of water potential of the Tigris River in riparian states is much more different than that of Euphrates River. Tigris River waters mainly originate in Turkey Iran, as well as Iraq. Syria does not contribute any significant discharge to the river.

Contrary to Euphrates River basin, several tributaries flow to Tigris river in the lower part of the Tigris Basin

Riparian contributions are expressed as ranges:

Turkey contributes an estimated 50 % of the river's annual discharge, Iraq 40%, while Iranian headwaters and tributaries are estimated to contribute between 10 % to Tigris river flow⁴¹. The most recent estimates to annual Tigris flow are 1833 m³/s (58 MCM) at Al -Qurna region before flowing to the Gulf (6).

Due to its geographic position, about half of the total Tigris flow originates in Turkey and as Turkey develops its water potential. its influence on the river's water regime will grow. In recent years, it is clear that "Tigris flow volumes have been affected by large water development projects in Iraq and Turkey".

Starting to fill Ilisu Dam reservoir may raise hydropolitical tension among riparian states. But Turkey and Iraq can solve this dispute with a paradigm shift from classical hydropolitics of 20th Century. The region's political instability, however, would make this a challenging endeavor.

Climate change is another challenging issue that has dramatically affected to water resources in the region (4). In 2006,2007,2008 Tigris river annual flow rate decreased as of 24 % of long term mean annual flow, while Euphrates River annual flow rate decreased 40%. In the year of 2008 the active storage rate of the dams in Euphrates and Tigris basins has dropped as of 23 %.

Realistic and Visionary Water Diplomacy Needed

Climatologically and Politically different New Middle East will require a new water equation and applicable solution for this equation with new water diplomacy paradigm. Any step towards the development of interdependence principle, in order to increase the relations of the countries with each other, will positively affect inter-country hydropolitics. Without mutual trust and mutual benefits between riparian states no sustainable and effective water agreement can be accomplished.

Development of water resources in Iran and Turkey will result releasing less Tigris water to Iraq. A prolonged reduction of the river would affect Iraq's supply of water and somehow reduce the amount of electricity it gets from hydroelectric dams.

In the Tigris and Euphrates Basin, developing the mutually beneficial interrelations certainly play the most fundamental role in the solution of the older hydropolitical problems. Climate change effects on water resource in the region is also an important concern. The only solution is the development of water management cooperation based on mutually beneficial approach that can be called "Real Hydropolitics".

Any step towards the development of the interdependence principle, not oil to exchange water, but developing relations of the countries, will positively affect inter-country hydropolitics. But Oil and Natural gas are the most suitable and basic natural resources in this regard. The

⁴¹ It is excluded Karkheh River and Karun River

two natural resources, water and oil, can contribute to this process through a rational plan that can develop bilateral relations and interdependence.

The riparian states should ultimately reveal their political will to manage all oil, gas and water resources for their own interest as much as possible. If this will come late, the problems will be much more complex.

What we talk about is not “Water-Oil Exchange”. it shouldn’t be misunderstood, we are talking about the development of a real cooperation based on mutual benefits,

Some Key points

- Main reason of the water shortage in the downstream is not only the dams built in Turkey
- The most applicable solution of the Middle East water problems lies in the development of mutually beneficial ways.
- Mutually beneficial approach will play the most fundamental role in solving the water problems, No way out!
- The Riparian States should demonstrate their political will to manage water, oil and gas resources for the benefit of their own interest as much as possible,
- 30 years ago, a water peace process has been started by Turkey. But this opportunity has been sacrificed because of the the riparian states domestic policy goals,
- The uncertainties about water management is rapidly shifting towards re-enforcing water into security policies in the region,
- Since the effects of climate change will increase after 2020, to set up stability in the region, there will be no other solution except for collaboration on water management.

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The Real “Access to Water Challenges” are Not Hydro Technical, but Hydro Political

Introduction

For the past several years, water has consistently been named as a leading risk in the World Economic Forum’s annual survey of global leaders, and newspapers worldwide are awash with stories warning of a water crisis.

Is the world really facing a water crisis? It is not easy to respond as Yes to this question, but we can easily say that uncertainties are coming towards to especially low-income societies. It can be considered a kind of crisis related with water

The uncertainties will create some serious problems but not in the way most people think. In fact, it should be realized that the real challenges are not technical or hydrological but political.

The world’s water problems are really more interrelated with real-world foreign policy challenges.

Water-related challenges

Water-related challenges that can be classified as three separates one in general

1. the world’s fresh water is very unevenly distributed, and mega cities will face serious water related problems because the world’s population is both growing and increasingly clustered in cities, it’s becoming more and more challenging to find enough water in different sectoral use such as energy, agriculture and domestic use at the same time This challenge is responsible for the overexploitation of many major rivers and ground-water aquifers worldwide.
2. Second, the hydrological cycle is fickle and often delivers either too much water, causing flooding, or too little, resulting in drought. Climate change is shifting both the magnitude and the seasonality of precipitation in many parts of the World including Turkey (3).
3. Third, Lack of clean water is another ancient scourge, but the scale of pollution from industrialized societies, which produce vast quantities of pesticides, fertilizers, and heavy metals, has again made the problem much worse.

Technical solutions and a new water security concern

We could admit that technical solutions exist to help solve these emerging problems to avoid a true water crisis. But the areas facing water scarcity can do much to improve their security of supply by using the water more efficiently.

Knowing that an enormous amount of water used by both cities and farms is effectively wasted. In most cities, rain is simply channeled into sewers, but storm water can be recycled and reused—as can wastewater.

Desalination from seawater, which is rapidly improving in efficiency, can protect some island and coastal cities from droughts,

Hydro technical development give us the opportunity that even very heavily contaminated water, moreover, can be purified—for a price. But the problem is that all of them are expensive, and at a global level, we have barely begun to answer the question of who should pay, and how much.

Who will pay it?

After building its massive Carlsbad Desalination Plant in 2015, San Diego warned residents it may have to increase water prices by up to seven percent per year until 2019(1).

Meeting the United Nations’ goals to achieve universal access to clean water and adequate sanitation is estimated to cost at least \$114 billion per year (1).

In many societies, the provision of water for both drinking and agriculture is seen as a core function of the state, and one that should be provided either for free or at highly subsidized rates. Even today, urban drinking water and irrigation is subsidized in virtually every country, usually in the form of massive government subsidies for building canals, reservoirs, and pumping stations.

Moreover, even if political leaders did suddenly decide to start raising water prices around the globe, it’s not clear how many could afford to pay.

Farmers, who account for the majority of water use worldwide, typically subsist on very low incomes, and raising water prices could increase rural unemployment and migration to cities, while possibly threatening food security. The problem is even worse for countries beset by a combination of severe water scarcity, poverty, and instability.

New Security Paradigm

When Foreign-policy makers look at the emerging climate change effects and difficulties clean water supply to low income societies, they will realize that there have been several reasons to be alarmed.

It has been cleared out that climate change dynamics may well play out in several water stressed places in the World.

What can USA and EU do to avert such a catastrophe?

The U.S. intelligence community on released a new report (2) finding that global warming is already acting as a destabilizing force worldwide, with more serious ramifications to come in the next two decades.

Globally, the report found that climate-related national security disruptions are already underway, with the potential for global warming impacts to overwhelm country's ability to absorb natural disasters and continue to govern its people.

The report states:

- Over 20 years, the net effects of climate change on the patterns of global human movement and statelessness could be dramatic, perhaps unprecedented. If unanticipated, they could overwhelm government infrastructure and resources, and threaten the social fabric of communities

These statements show that they are very aware of the problem coming towards the modern world. Before conclusion, in order to make a general risk assessment that the modern world will face there are some questions (4) to be asked regarding with water stress regions.

- Are the region's water resources being managed sustainably and efficiently?
- Are water services being delivered reliably and affordably?
- Are water-related risks being appropriately recognized and mitigated?

If we got the answers as “NO” for many regions under threat, It indicates that we are so late....

What to Do?

The first step is forwarding a new international water security paradigm and rethinking on the risk of conflict between countries in shared river basins. Water related crisis may destabilize local and national politics creating large-scale population movements and other risks to foreign and security policy. It is needed to rise an awareness with a risk analysis.

It is also considered that governments need to phase out subsidies for the water sector that contribute to inefficient and wasteful water use. This will be politically perilous, but there is a precedent in the form of an international effort to help countries phase out wasteful fuel and energy subsidies in a responsible way.

The international community needs to initiate a serious discussion on how to help countries solve their serious water crises, which may well represent the difference between success and failure for fragile states.

We can see some promising initiatives are under way in several fragile and water-scarce states. But at the end of the day, none of these initiatives are likely to succeed without significantly increased financing.

The world's water Hotpoint areas need enough financial support, willpower, research creating actionable knowledge and new hydropolitics paradigm.

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