Addressing the Complex Context Behind the Drying Up of the Euphrates River

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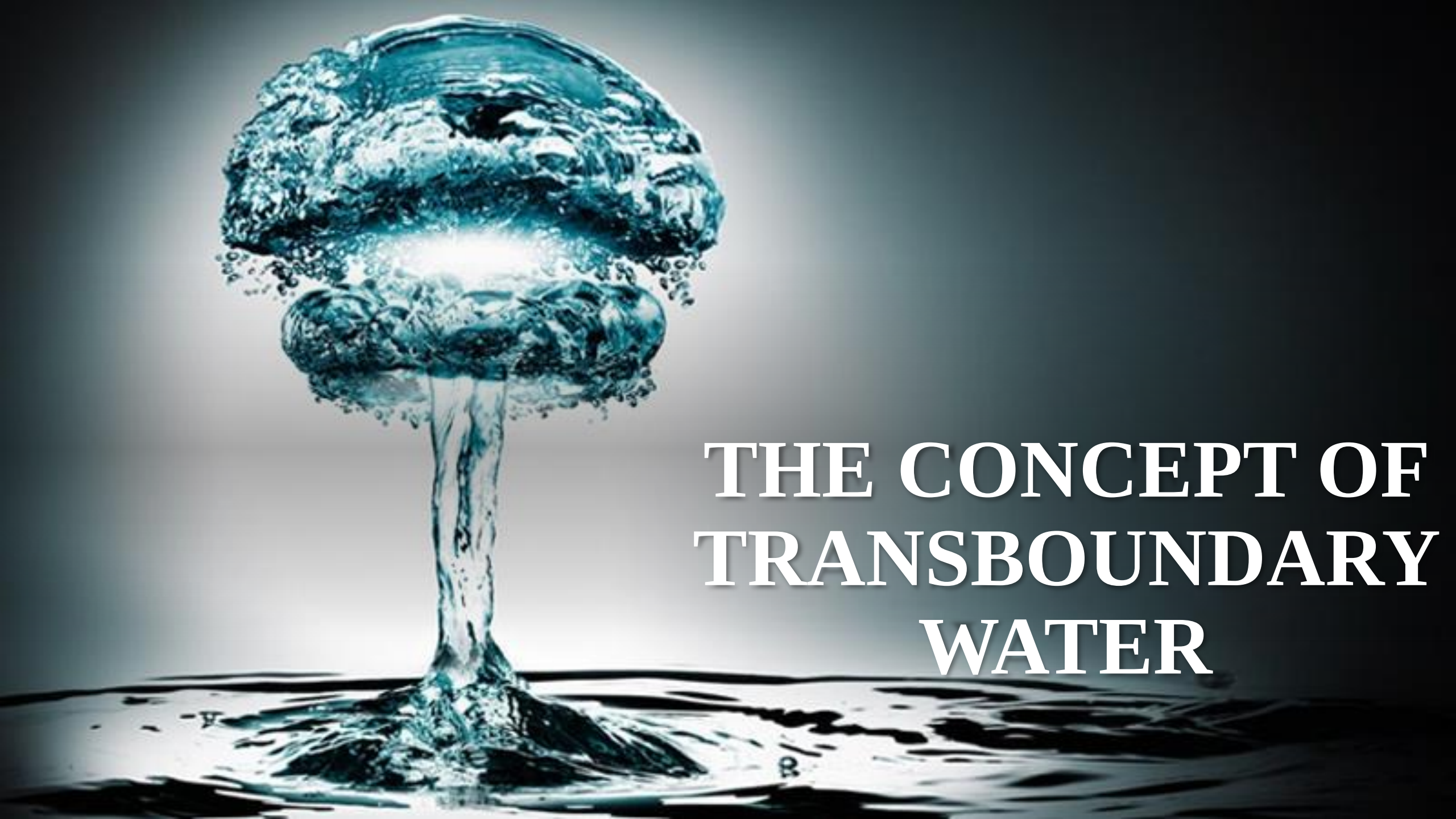
IN THIS PRESENTATION:

- **THE CONCEPT OF TRANSBOUNDARY WATER**
- **THE EUPHRATES RIVER**
- **ADDRESSING THE DRYING UP (DRIVERS, ACTIVITIES, RESPONSES)**
- **CONCLUSION**



THE CONCEPT OF TRANSBOUNDARY WATER

- More than 263 of surface water systems are considered transboundary water which accounts for about 60 % of freshwater globally ((GIZ) 2011; Earle et al., 2010).

- The United Nations Economic Commission for Europe Water Convention: Any surface or ground waters which mark, cross or are located on boundaries between two or more States", (UNECE 1992).

- The UN Convention 1997: watercourse, parts of which are situated in different States" (United Nations 2009).

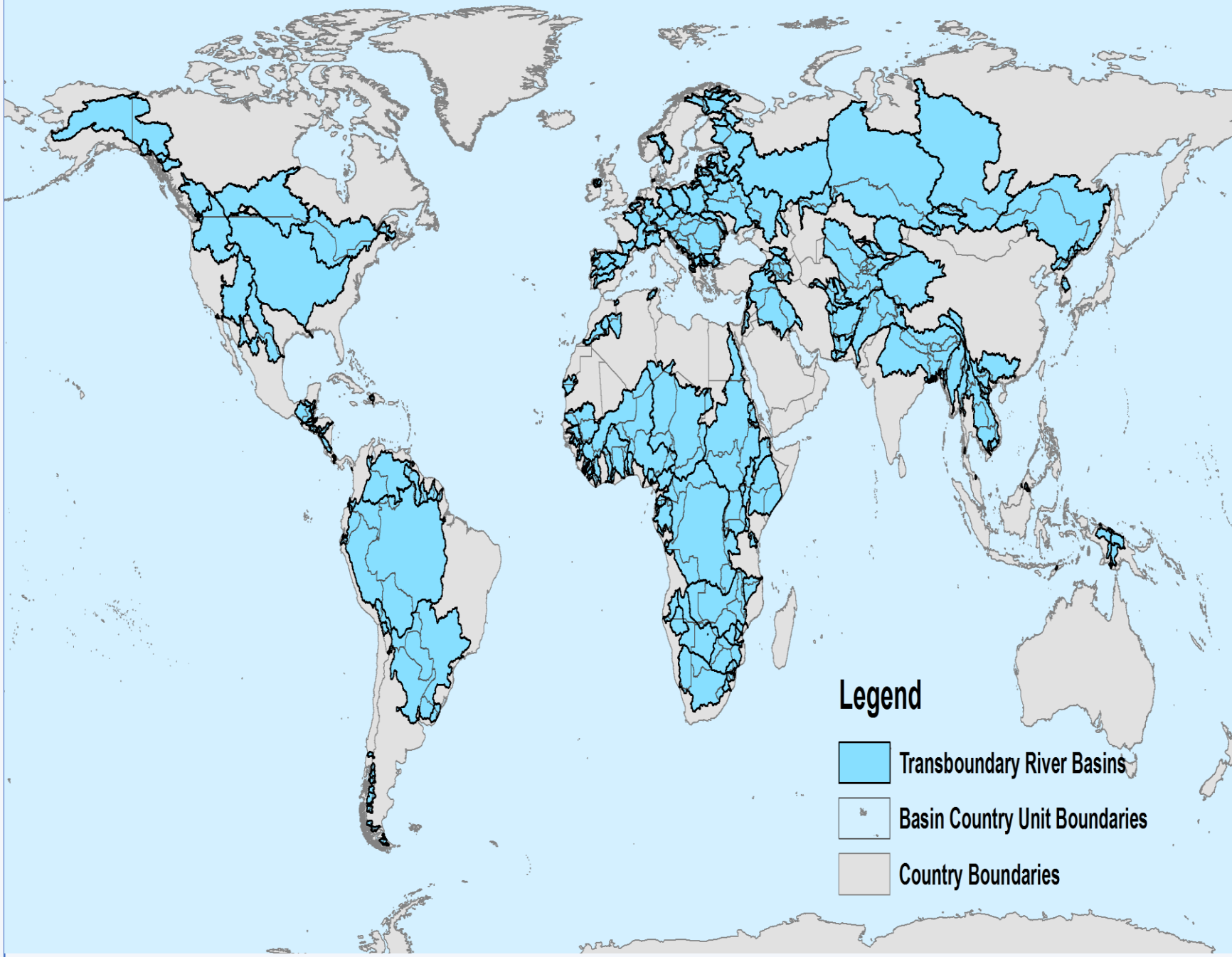
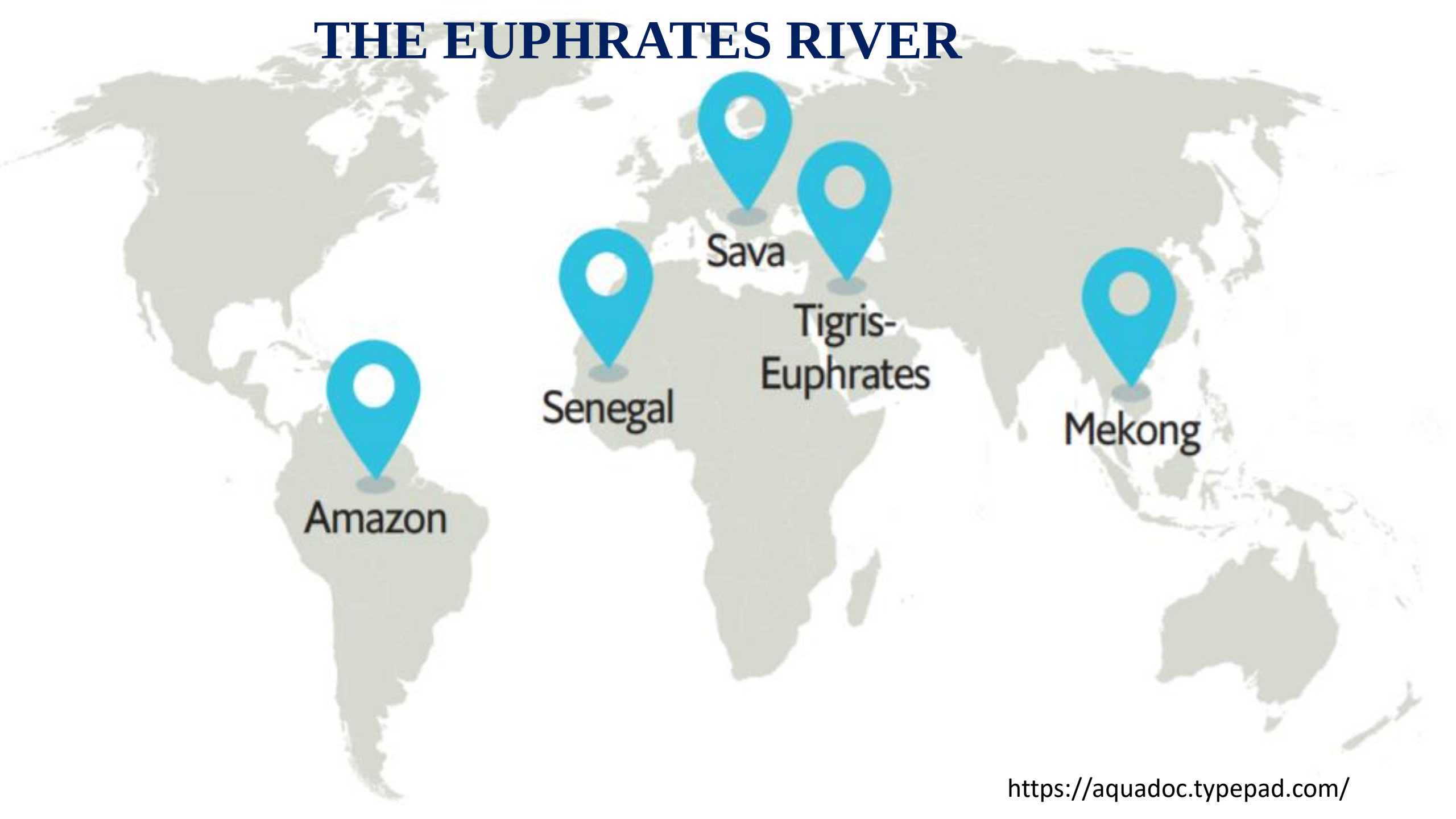


Figure (1). Global Transboundary water. Map source: http://twap-rivers.org/

THE EUPHRATES RIVER



https://aquadoc.typepad.com/

The Euphrates River

- It supports more than 23 million people in the riparian countries by providing various essential services including drinking water and its use for energy generating (UN-ESCWA and BGR 2013).
- It is the longest river in Western Asia in with a total length of about 2,786 km.
- **Table (1). Euphrates length in each riparian state.**

Riparian state	Turkey	Syria	Iraq
Length (km)	915	675	1200
Percentage	33%	24%	43%

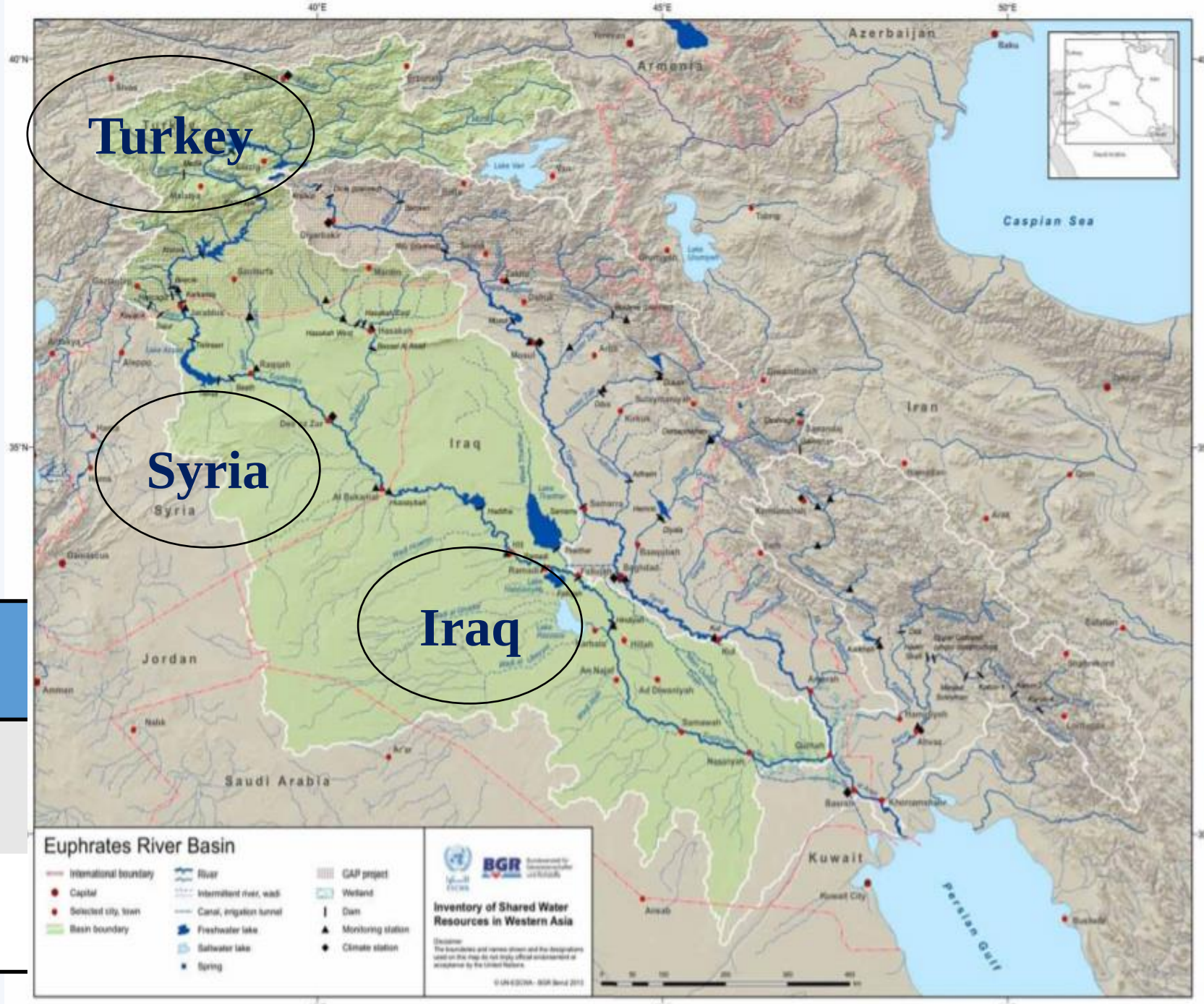


Figure (2). The Euphrates Basin. Map source: (UN-ESCWA and BGR 2013)

The Hydro-diplomacy in the Euphrates Basin

- **The Agreements in the basin**
  - No effective multilateral agreements about cooperation that have been reached between the riparian countries for more than thirty years with an exception of 1980 protocol for Technical and Economic Cooperation that is no longer valid, (Erdem 2002).

- **The water datasets in the basin**
  - This lack of cooperation is well illustrated in the data sector where there is an enormous lack of water data due to the fact that each of riparian countries of Euphrates have collected various water datasets, but access to this information is restricted and the countries often do not share data with each other (Aither 2018).
  - The water data of north-central region of the Middle East is often not transparent or accessible and tends to be unreliable, as it is not collected regularly (Weinthal et al., 2015).

The Flow of the Euphrates

- Records show a negative trend of decreasing mean annual flow due to natural and man-made reasons (UN-ESCWA and BGR 2013).

- The political instability and inefficiency in the Middle East, has contributed to the continuous decline of the Euphrates flow due to lack of cooperation and destruction of facilities (Shamout and Lahn 2015; Sundeep 2011).

- Also, Euphrates may diminish by 30% in 2100 due to climate change only (Sundeep 2011).

Addressing the drying up of Euphrates

- Drivers,
- Activities,
- State
- The required responses

What are the drivers behind the drying up?

Quest for water

Water dependency ratio

The percent of total renewable **water** resources originating outside the country.

Water stress level

Freshwater withdrawal as a proportion of available freshwater resources (http://www.fao.org/)

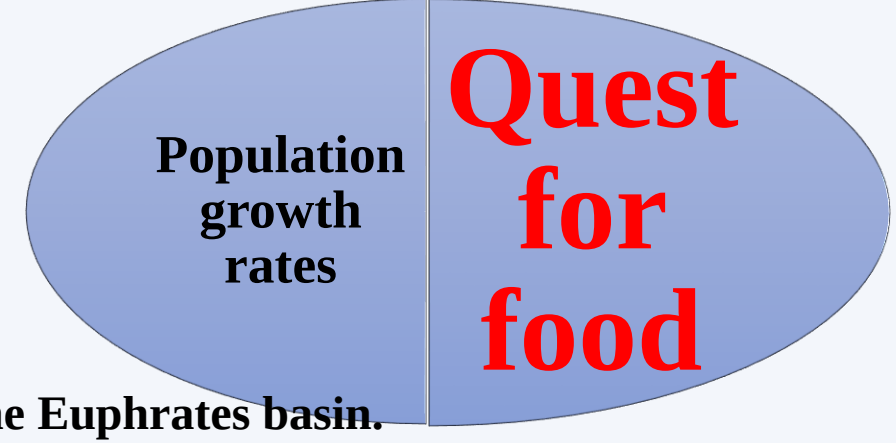


Table (2). The population number in the Euphrates basin.

Riparian country	Estimated population in the basin		Rate of growth
	Millions	As percentage of total basin population	
Turkey	7.15	31	1.6%
Syria	5.69	25	3.7%
Iraq	10.2	44	3.7%
Total	23.04		

Economic development

- Turkey's economic is considered the largest and most powerful between the three riparian countries economics and also in the central and eastern Europe (Shamout and Lahn 2015).
- This rapidly developing economic requires greater amounts of water which puts Turkey in a problem to adapt to water stress, so, Turkey is covering that by building GAP project that has declined significantly the flow of Euphrates (Al-Ansari et al. 2018).

Figure (3). The Gap project.

Climate Change:

- The basin is characterized as semi-arid to arid area with high vulnerability to the climate change (Shamout and Lahn 2015; UN-ESCWA and BGR 2013). However, both Syria and Iraq are mainly threatened by climate change specifically prolonged droughts by decreasing in precipitation and rising of temperatures which reflect negatively of Euphrates discharge (Al-Ansari et al. 2018; Sundeep 2011; UN-ESCWA and BGR 2013).

- Euphrates and its tributaries are highly sensitive to climate change due to their dependence mainly on precipitation (Ibrahim and Mensah 2017; Venturi and Capozzoli 2017).
- Euphrates main annual flow shows decreasing trend compatible with the prolonged drought sequences in Syria and Iraq (UN-ESCWA and BGR 2013).
- This reality emphasises the importance of accelerating climate adaptation and water adaptation.

What are the activities linked to the drying up?

Hydro-engineering projects:

The excessive water regulation and abstractions by three countries have affected Euphrates annual flow that has shrunk in all monitoring stations since 1973. For instance the flow dropped from 30 BCM in 1973 to 22.8 BCM after 1990 in the Syrian-Turkish border point, (UN-ESCWA and BGR 2013).

Figure(4). Tabqa Dam, Syria

Figure(5). Keban Dam, Turkey

Irrigation projects:

- Agriculture is a main activity in the three riparian countries. Large agricultural areas are widespread in the riparian countries and need irrigation with intensive amounts of water especially for water-intensive crops cultivation like cotton in Syria and Iraq.

- Roughly 75–80 % of the Euphrates water is used in agriculture in Turkey, Syria and Iraq, (Shamout and Lahn 2015).

- On the other hand, the irrigation technologies are old and also a major cause for water loss due to its inefficiency and increasing evaporation, (Al-Ansari 2016).

Water supply and allocation projects

Table (3). Water allocation per capita per year in the riparian countries.

Country	1990	2000	2010	2020
Turkey	3223	2703	2326	2002
Syria	1636	117	880	760
Iraq	2352	1848	1435	1062

What is the current state of the Euphrates?

Changes in Euphrates flow

- The Euphrates transferred from a snowmelt river to a regulated river.

Degradation of water quality

- As a result of point and diffuse pollution sources along the basin. This phenomenon is mainly in Syria and Iraq due to the lack of infrastructures in Syria and Iraq, (Ibrahim and Mensah 2017; Shamout and Lahn 2015; UN-ESCWA and BGR 2013).

Degradation of the environment

- Degradation of the delta of Shatt Al-Arab;
- Drying of Iraqis Wetlands and marshlands;
- Land degradation.

Variation of the environmental flows of Euphrates

- Euphrates environmental flows in agriculture, irrigation and hydropower have increased because the riparian countries utilize Euphrates water in these domains, (Granit and Joyce 2017). On the other hand, capability of Euphrates to provide its ecosystem services has varied and decreased severely in some sectors.

THE REQUIRED RESPONES

Strategic Water Management Vision:

On national level, every riparian country should achieve good governance by adopting an integrated water management plan that contains the following points in order to be useful and nourish Euphrates:

- Rehabilitation of infrastructures to decrease the leakage and pollution of Euphrates water which should cover water treatment plants, power plants as well as pumping stations;
- Creating strong water institutions to provide clarity about data and coordination between the various stakeholders within the same country;
- Promote the stakeholders' role to improve the water resources health.

This step will require a lot of time and money in Syria and Iraq especially during the war period that both countries are passing.

Social responses:

Raising awareness about the importance of family planning concept is essential in the three countries to control the population growth rate in order to control the water demand. Moreover, governments of Syria and Iraq should encourage farmers and people of rural areas to go back and stay in these areas by developing programs in order to reduce the pressure from urban areas. This step is very hard to accomplish in the Middle East due to traditions and social values, so, it will need a lot of time and hundreds of thousands of Dollars only. Changing the mindsets of these people require persistence and governmental and religious support for the programs, so, it may take many years.

Developing responses by creating joint mechanisms and institutions:

- Establishing a joint mechanism that has a binding authority to manage the basin and create a data bank which includes reliable climatological, hydrological, geological, environmental and soil data to be used by researchers and decision makers;
- Restoration of Iraqis wetlands and marshlands should be a priority for the riparian countries by conducting research and try new methods;
- Groundwater resources management should be a main concern for management of the riparian countries.

CONCLUSION

- Euphrates has played an integral role in people’s life and has been a reason of prosperity in the Region. Thus, Euphrates drying up is a catastrophe that threatens mainly Syria and Iraq.
- The riparian countries hydro-relations are full of tension and conflicts due to the different interests between upstream, midstream and downstream countries.
- Policymakers should keep in mind the interlinkages between the drivers behind the excessive consumption of the Euphrates water which lead to implement activities by the riparian counties which they pressure Euphrates system.
- Thus; responses are needed to mitigate the drying up of Euphrates and restore this river as a transboundary system in order to gain its services again.

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THANKS FOR LISTENING

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