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The Application of the Principle of "Equitable and Reasonable Utilization" in the Tigris-Euphrates River Basin

(Original Research)

Azam Amini*
Mohammad Abedi**
Ehsan Daryadel***

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Abstract

The principle of equitable and reasonable utilization is the cornerstone of customary and general international law governing transboundary watercourses. However, its application in the Tigris-Euphrates basin is legally and politically complex due to unilateral actions such as dam construction and water diversion projects. Achieving sustainability and harm prevention alongside equitable allocation requires balancing riparian States' needs, ensuring equitable participation in decision-making, and addressing distributive justice based on each State's circumstances and dependencies. This research employs a descriptive-analytical approach to explain this principle, identify its conventional and customary sources, and assess the factors affecting its application. It examines the Basin's geographical, natural, and environmental conditions to evaluate how the principle is applied. The construction of dams, excessive use of groundwater, and extensive irrigation have led to reduced water inflow and severe impacts on agriculture, the environment, and local communities. These issues highlight a weakening commitment to equitable utilization. Urgent cooperation among riparian States is needed to develop a comprehensive plan that ensures fair water use and sustainable ecological preservation for the Tigris and Euphrates Basin. Findings indicate that unilateral actions have reduced water inflows, harming agriculture, wetlands, and local communities. To ensure equitable utilization, riparian States must

* Corresponding Author, Asscoiate Prof., Public International Law, Faculty of Law and Political Science, Ferdowsi University of Mashhad, Mashhad, Iran; ID: 0000-0003-3580-8459; amini.az@um.ac.ir

** Associate Prof., Private Law, Faculty of Law and Political Science, Ferdowsi University of Mashhad, Mashhad, Iran; dr.m.abedi@um.ac.ir

*** Ph.D Candidate in Water Law and Policy, Murdoch University, Australia; ID: 0000-0003-4548-8559; ehsandaryadel2020@gmail.com

adopt a binding legal framework. Establishing joint governance, data-sharing mechanisms, and applying wise use principles, particularly for wetland conservation, are crucial for sustainable water management, fair allocation, and long-term regional stability.

Keywords
International Water Law, Hydro-politics, Riparian States' Rights and Obligations, Distributive Justice in Water Allocation, Wise Use Principle.

1. Introduction

Watercourse means a system of surface waters and groundwater constituting by virtue of their physical relationship a unitary whole and normally flowing into a common terminus.[1] Therefore, the watercourse's basin is a general and indivisible area whose location in the sovereignty of several States does not affect its natural characteristics and uniqueness.[2] In this study, the Tigris and Euphrates river basin, along with international watercourses, underground waters and water transfer canals and wetlands located in the area of these two rivers, are being addressed.

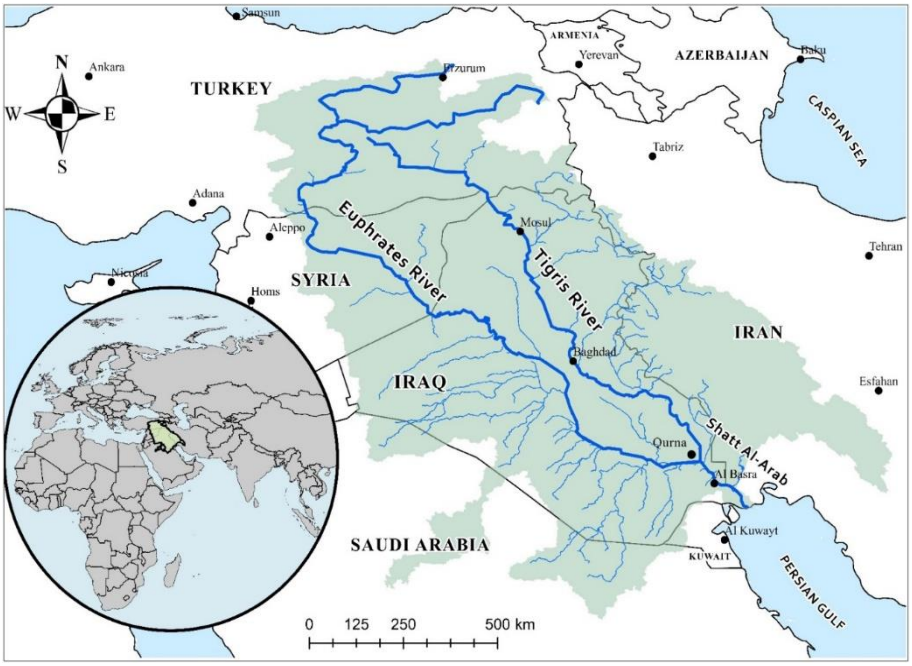
Tigris and Euphrates (Figure 1) are situated in the territory of 4 West Asian countries, and under the urgent demand of the population of the region for water. Lack of cooperation among these riparian States has worsened the situation for achieving the goal of optimum and sustainable utilization. These have led to the creation of immense political and security issues. The constantly growing population of the region has been the main factor behind the efforts made by the countries to increase utilization, and this has affected the speed and type of development. In Syria, 95% of water is used in agriculture, 3.3% in households, and 1.8% in industry. In Iraq, 79% is used in agriculture, 14.5% in industry, and 6.5% for domestic use.[3]

1. Stephen C McCaffrey, The law of international watercourses (Oxford University Press, 2019).

2. Djamshid Momtaz, "International legal system of waterways and water resources in the Middle East (Persian)", *International Law Review* 13, no. 18-19 (1995).

3. "Global Information System on Water and Agriculture," 2008, accessed 23 August 2024, https://www.fao.org/ aquastat/en/countries-and-basins/country-profiles/country/IRQ.

Figure 1. The Tigris-Euphrates Drainage Basin[4]



Population growth in the region has been significant over the past 50 years, and this increase has put high pressure on riparian States in order to access water. The total population of the Tigris and Euphrates river basin is around 50.69 million people, with 4.81 million people in Syria, 31.1 million people in Iraq, 13.3 million people in Turkey, and 1.48 million people in Iran.[5] According to recent predictions by the World Bank, the total population of the region is estimated to reach more than 200 million people by the year 2050.[6] The noticeable driving force of population has resulted in increased development efforts for providing food and energy for a much bigger population, and unilaterally upstream multipurpose projects for maintenance

4. Amirhossein Montazeri, Mehdi Mazaheri, Saeed Morid, and Mohammad Reza Mosaddeghi, "Effects of upstream activities of Tigris-Euphrates River Basin on water and soil resources of Shatt al-Arab Border River," *Science of The Total Environment* 858 (2023).

5. Nadhir Al-Ansari, "Hydro geopolitics of the Tigris and Euphrates" (paper presented at the Recent Researches in Earth and Environmental Sciences: 2nd International Conference on Advanced Science and Engineering 2019 (ICOASE2019) Zakho-Duhok, Kurdistan Region—Iraq, April 2–4, 2019, 2019).

6. United Nations Economic and Social Commission for Western Asia & Federal and Institute for Geosciences and Natural Resources, Inventory of shared water resources in Western Asia, United Nations (Beirut, 2013), http://www.unescwa.org/publications/inventory-shared-water-resources-western-asia.

of such a goal have been implemented regardless of other countries' demands and the environmental needs of these two rivers, thereby changing the status of the region.[7]

Turkey, as an upstream State of the Tigris and Euphrates, played a key role in changes in the basin via the implementation of extensive water-storage plans in the region, referred to as the GAP Project.[8] Syria and Iraq have also gone beyond the conventional construction of dams, canals and the use of underground waters.[9] However, Turkey has considered economic development and growth as its justification for the implementation of the GAP Project. Syria and Iraq, as downstream countries of the Tigris and Euphrates, have regarded the purpose behind Turkey's plan as a political tool and accused it of using water as a weapon.[10] In other words, they consider the dam construction projects of Turkey as a threat to their political security.[11] Notwithstanding, the drainage of wetlands in the basin and its environmental implications are irrefutable facts,[12] and consequently, severe dust has afflicted Iranian people in the southern and western parts of the country.[13]

The construction on the Tigris and Euphrates rivers (Figure 2) by the riparian States raises the question of whether, given the natural conditions of the basin and the needs of the States, building dams of this scale and capacity constitutes equitable and reasonable utilization. To answer such questions, it is necessary to investigate the general features of the Tigris and Euphrates river basin in the first place, then scrutinize per capita annual water allocation by Turkey, Syria, and Iraq, and finally study the number and capacity of dams and structures and the socio-economic situation of the basin. Accordingly, relevant data are presented in Tables 1 and 2.

7. Samantha Glass, Twisting the tap: water scarcity and conflict in the Euphrates-Tigris River basin, *Yale University* (2017), https://digitalcollections.sit.edu/isp_collection/2594/.

8. Anna Bachmann, Virginia Tice, Laith Ali Al-Obeidi, and Dicle Tuba Kilıç, "Tigris-Euphrates River ecosystem: A status report" (paper presented at the Mesopotamia Water Forum, 2019).

9. Aysegül Kibaroglu *et al*., "Cooperation on Turkey's transboundary waters," Status Report Commissioned by the German Federal Ministry for Environment, Nature Conservation and Nuclear Safety, Fþ E. Project 903 (2005).

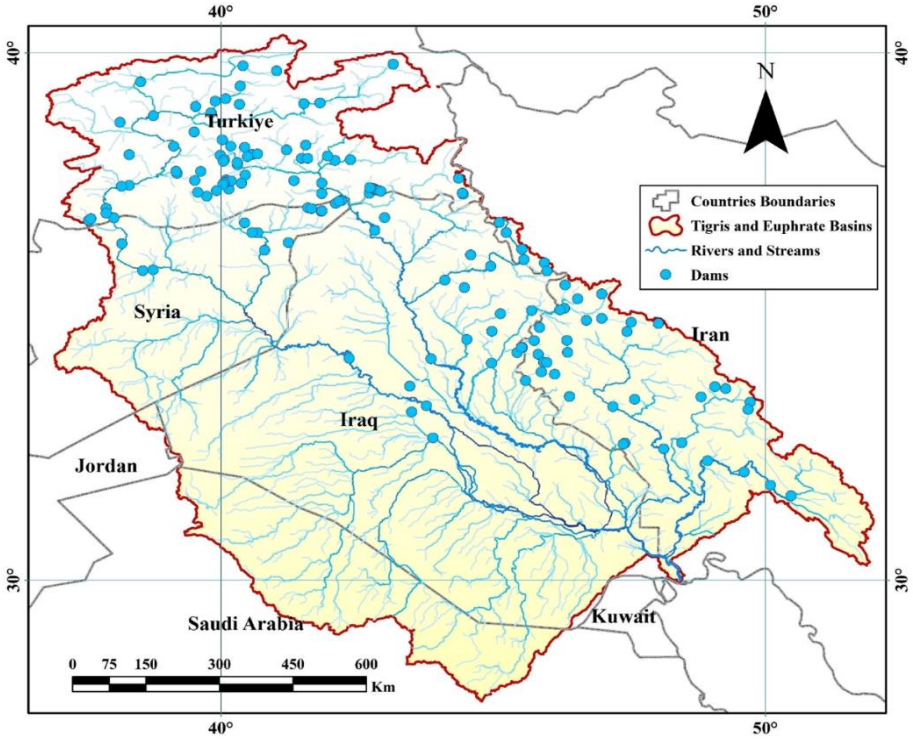
10. Korkutan, Salih. "The sources of conflict in the Euphrates-Tigris Basin and its strategic consequences in the Middle East." PhD diss., Monterey, California. Naval Postgraduate School, (2001).

11. Thomas Naff, "Conflict and water use in the Middle East," Water in the Arab World: Perspectives and Prognoses (1994).

12. Adele J Kirschner and Katrin Tiroch, "The waters of Euphrates and Tigris: an international law perspective," Max Planck Yearbook of United Nations Law Online 16, no. 1 (2012).

13. Toon Bijnens, "Hydrologic Structures in the Tigris-Euphrates Basin and Their Impact on the Vitality of the Marshes," in Southern Iraq's Marshes: Their Environment and Conservation (Springer, 2021). Narges Akbari and Ali Mashhadi, "Environmental Threats and Obligations of the Government of Turkey in Implementing the GAP Project in Relation to Environmental Impacts in Iran (Dust Storms)", *International Law Review* 36, no. 61 (2019).

Figure 2. The Tigris-Euphrates River Basin and the Dams in the Basin[14]



14. Qaraman M Hasan *et al*., "When the law is unclear: challenges and opportunities for data and information exchange in the Tigris-Euphrates and Indus river basins," *Water Policy* 25, no. 8 (2023), https://doi.org/https://doi.org/10.2166/wp.2023.261.

Table 1- General Features of the River Basin[15]

	Tigris River Basin	Euphrates River Basin
Basin Countries	Iran, Iraq, Syria, and Turkey	Iraq, Jordan, Saudi Arabia, Syria, and Turkey
Area of Countries in the Basin	Iran: 19%, Iraq: 56%, Syria: 0/5%, and Turkey: 24.5%	Iraq: 47%, Jordan: 0/3%, Saudi Arabia: 2/97%, Syria: 22%, and Turkey: 28%
Area of the Basin	221,000 km^2	440,000 km^2
Length of the River	1,800 km	2,786 km
Average Annual Volume of the Flow in the Border of Turkey and Iraq	47 BCM (at Kut)	Before damming (1930-1973): ~30 BCM After damming (1974-2010): ~25 BCM
Important Dams	14 (max. storage capacity 116.5 BCM)	>60 (max. storage capacity 144 BCM)
Area of Lands Under Irrigation Outside of the Basin	150 ha	-
Area of Lands Under Irrigation Inside the Basin	4.7 million ha	5.4 million ha
Population of the Basin	27.36 million	23.4 million

Table 2- Average Annual Water Availability per Capita in Turkey, Syria, and Iraq[16]

	1990	*2000*	*2010*	*2020*
Turkey	3223	2703	2326	2002
Syria	1636	1177	880	760
Iraq	2352	1848	1435	1062

Table 3 indicates that, on the one hand, the capacity of constructed dams and structures of riparian countries neighboring the Tigris and Euphrates river basin is more than 3 times the total annual catchment of this basin. The capacity of these structures on the Tigris river basin is approximately 5

15. UN-ESCWA, *ibid*, 2.

16. Dogan Altinbilek, "Development and management of the Euphrates–Tigris basin", *International Journal of Water Resources Development* 20, no. 1 (2004) https://doi.org/10.1080/07900620310001635584.

times. On the other hand, whereas nearly 89 per cent of the Euphrates River basin flows from Turkey, this country is able to reserve more than 3 times the total catchment of the Euphrates behind its dams. Additionally, the storage capacity of structures and dams of Turkey on the Tigris river basin is 17/6 billion cubic meters. In comparison, the average annual flow of the Tigris river basin near the border of Turkey and Iraq is approximately 16.8 billion cubic meters.[17] This indicates that Turkey can store all the water resources from the Tigris River in this country. Furthermore, the total capacity of dams and structures built in Turkey on the Tigris and Euphrates rivers is 1.55 times the total water resources of this basin, while this statistic for Iraq is 0.88. The total capacity of structures built on the Tigris and Euphrates basin is, on average, 217 billion cubic meters, which is about 2.6 times the total water resources in this basin. Among these, Turkey has allocated 66.5% for its operational dams, Iraq 22.9%, Syria 8.6%, and Iran 1.8%. Additionally, for planned dams, Turkey has allocated 29%, Iraq 70.5%, and Iran 0.4%.[18]

Table 3- Capacity of Constructed and Constructing Structures of Riparian States on the Tigris and Euphrates Basin (Billion Cubic Meter)[19]

River's name	*Turkey*		*Syria*		*Iraq*		*Total*	*Percentage of the total average flow of the basin*
	Storage Capacity	**Percentage of total catchment of the basin**	**Storage Capacity**	**Percentage of total catchment of the basin**	**Storage Capacity**	**Percentage of total catchment of the basin**		
Tigris River Basin	17/6 %	35 %	1/5 %	3 %	130 %	260 %	149 %	*threefold*
Euphrates River Basin	98 %	32/5 %	17/7 %	59 %	37/6 %	125%	153 %	*fivefold*
Total of Tigris and Euphrates	115/6 %	145 %	19/2 %	25 %	167/6 %	210 %	302 %	*3.8 fold*

17. Ali Ihsan Bagis, "Turkey's Hydropolitics of the Euphrates-Tigris Basin", *International Journal of Water Resources Development* 13, no. 4 (1997), https://doi.org/https://doi.org/10.1080/07900629749647.

18. Hojjat Mianabadi and Azam Amini, "Complexity of water, politics, and environment in the Euphrates and Tigris river basins (Persian)", *Geopolitics Quarterly* 15, no. 54 (2019).

19. *Ibid*, 54-86.

The actions taken on the Tigris and Euphrates rivers by the riparian States raise the question of whether, considering the natural conditions of the basin and the needs of the States, the construction of dams at this scale and capacity constitutes equitable and reasonable utilization. This study aims to examine how the principle of equitable and reasonable utilization is applied in the Tigris and Euphrates basin. The findings of this research provide a foundation for multilateral transboundary governance and contribute to the sustainability of communities in the region.

2. Principle of Equitable and Reasonable Utilization in the Tigris and Euphrates Basin

The principle of equitable and reasonable utilization seeks to balance the sovereign rights of riparian States over their territorial waters with the shared benefits of all States dependent on an international watercourse in mind.[20] Whilst sovereign equality does not imply an equal right to water use.[21] This principle, rooted in equity, ensures that utilization considers all relevant factors, including the needs, capabilities, and responsibilities of each State. In the same vein, while sovereign equality grants each State the right to use the watercourse within its territory, it does not imply equal division of water resources. Rather, the principle is based on equity, which requires balancing competing interests by considering factors such as need, economic capacity, and environmental responsibilities. This interpretation is enshrined in Article 5(1) of the 1997 UN Watercourses Convention.[22] Procedurally, it mandates equitable participation in decision-making (Article 5(2) of the Convention), ensuring a cooperative framework for managing shared waters.[23] Substantively, equitable utilization considers three domains: (1) need—aligning water allocation with development and poverty eradication; (2) capability—ensuring financial and technical contributions are proportional to a State's means; and (3) responsibility—recognizing that water use obligations vary based on a State's capacity.[24]

Equitable and reasonable utilization serves both as a goal and an operational process that requires balancing the needs and uses of riparian States while

20. Momtaz, *ibid*, 74.

21. International Law Commission (ILC), Draft articles on the law of the non-navigational uses of international watercourses and commentaries thereto and resolution on transboundary confined groundwater (1994).

22. Owen McIntyre, "Water, law and equity," The Human Face of Water Security (2017).

23. *Ibid*.

24. Alistair Rieu-Clarke, Ruby Moynihan, and Bjørn-Oliver Magsig, UN Watercourses Convention: user's guide (IHP-HELP Centre for Water Law, Policy and Science (under the auspices of UNESCO), 2012).

accounting for natural, social, and economic factors.[25] This principle seeks optimal and sustainable use of international watercourses by not only maximizing economic productivity but also ensuring maximum benefits for all riparian States, and minimizing potential harm. Sustainable use requires balancing economic, social, and environmental values and considering the long-term carrying capacity of the watercourse. Adequate protection of water resources is also integral to this balance, requiring States to not only adopt conservation measures but also to implement technical and hydrological controls for effective resource management.[26]

The concepts of "reasonableness" and "equity" are interconnected but distinct. The former assesses the quality of various uses and is measured by applying the standard of a reasonable person, while the latter is applied in balancing competing uses between States. Reasonableness differs from "beneficial use" or "best possible use" and considers factors such as a State's level of development.[27] While reasonable utilization and the principle of "wise use" share similarities, their standards differ: wise use of wetlands includes criteria such as preserving ecological character, sustainable development, and precautionary principles, whereas reasonableness in international watercourses considers factors such as the natural characteristics of the basin, socio-economic needs, dependent populations, historical usage, and existing practices.[28] However, when assessing equitable and reasonable utilization in relation to ecosystem conservation, particularly in wetlands, the standards of wise use should be incorporated. For this reason, the Berlin Rules[29] emphasize the need to balance a State's right to use watercourses with its obligation to prevent significant harm and ensure sustainable conservation. Article 13 of the Berlin Rules explicitly links environmental harm reduction to equitable utilization, ensuring that no significant harm is a key consideration.[30]

25. Andrew Allan, "The role of reasonableness in assessing equitable and reasonable use," Ymparistojuridiikka 1 (2009).

26. Rieu-Clarke *et al*., *UN Watercourses Convention: user's guide*, 107-108.

27. Seyed Ghasem Zamani and Pouya Berelian, "The Concept and Realm of the Principle of Equitable and Reasonable Utilization of Shared Water Resources: From the Perspective of International Law", *The Quarterly Journal of Public Law Research* 75, no. 24 (2022).

28. Lee Jing, Preservation of ecosystems of international watercourses and the integration of relevant rules: An interpretative mechanism to address the fragmentation of international law, vol. 2 (Martinus Nijhoff Publishers, 2014).

29. International Law Association (ILA), "Report of the Conference on Water Resources Law (adopted at the 71st Conference, Berlin, August 2004)," (2004). https://unece.org/fileadmin/DAM/env/water/meetings/legal_board/2010/annexes_groundwater_paper/Annex_IV_Berlin_Rules_on_Water_Resources_ILA.pdf.

30. The no significant harm principle requires states to act in a manner that prevents substantial harm to other riparian states, particularly by avoiding transboundary environmental or economic damage. This principle prioritizes harm prevention, ensuring that watercourse states do not create situations that would negatively impact their co-riparian countries.
In contrast, the principle of equitable and reasonable utilization focuses on allocating water resources fairly among riparian states, taking into account factors such as population needs, economic interests, and

Notably, even if a use is deemed reasonable, it may still be challenged from the perspective of equitable utilization, as the principle of equitable and reasonable utilization views equity as a broader framework within which reasonableness remains a relative concept.[31]

2-1. International Custom as Evidence of a General Practice Accepted as Law

The principle of equitable and reasonable utilization in international law has not only a customary foundation but is also recognized in international instruments, as well as domestic and international judicial practice.[32] National court rulings affirming this principle include the Swiss Federal Supreme Court's decision in *Zurich v. Canton Schaffhausen* (1878)[33] and the U.S. Supreme Court's rulings in *Kansas v. Colorado* and *Wyoming v. Colorado*,[34] all of which upheld the notion of equitable water use. Similarly, the Permanent Court of International Justice (1929)[35] in the *Oder River* case emphasized the "community of interest" principle, deeming unilateral appropriation unlawful.

geographic conditions. While this principle seeks to balance competing interests, it does not necessarily prohibit all forms of harm, provided that the use remains equitable and justifiable.
The 1997 Watercourses Convention integrates both principles but prioritizes equitable and reasonable utilization as the guiding rule, with the obligation to prevent significant harm functioning as a secondary consideration. In contrast, the Berlin Rules (2004) strengthen the connection between the two principles by emphasizing sustainable development and cooperation, suggesting that equitable and reasonable utilization inherently includes a duty to prevent significant harm. On the other hand, the Helsinki Rules (1966) imply that some level of harm may be permissible if the water use is deemed equitable and reasonable, provided the harm does not exceed acceptable limits. For example, in cases where an upstream state's water use affects a downstream state, the burden falls on the affected state to prove that the harm is disproportionate or unjustified under the broader framework of equitable utilization.
In practice, these principles operate in tandem through cooperative mechanisms, ensuring that states not only pursue equitable water use but also take responsibility for preventing significant harm. A notable example is the Lake Lanoux Arbitration, where the tribunal ruled that France had the right to utilize its water resources but was obligated to consult and negotiate with its co-riparian to ensure that its actions did not cause significant harm to shared interests. For further analysis, see Philine Wehling and Philine Wehling, "Customary principles of international water law," *Nile Water Rights: An International Law Perspective* (2020); Attila M Tanzi, "The inter-relationship between no harm, equitable and reasonable utilisation and cooperation under international water law," *International Environmental Agreements: Politics, Law and Economics* 20, no. 4 (2020).

31. Rieu-Clarke *et al*., *UN Watercourses Convention: user's guide*, 109.

32. Ali Zare and Mohammad Hossein Ramazani Ghavam Abadi, "Environmental controversies in the Tigris and Euphrates basin countries about Turkey's dam construction in international law," *Environmental Sciences* 19, no. 1 (2021).

33. Dietrich Schindler, "The administration of justice in the Swiss Federal Court in intercantonal disputes", *American Journal of International Law* 15, no. 2 (1921):160

34. Robert D Scott, "Kansas v. Colorado Revisited", *American Journal of International Law* 52, no. 3 (1958).446-448, 451-453

35. Permanent Court of International Justice (PCIJ), "Territorial Jurisdiction of the International Commission of the River Oder, United Kingdom v Poland, Order," (Permanent Court of International Justice (historical) [PCIJ]. Series A no 23. (30 Oct 1928 1929).

In the *Lake Lanoux* arbitration,[36] the tribunal underscored the obligation of upstream States to consider the interests of downstream States. The International Court of Justice (1997) in the *Gabčíkovo-Nagymaros* case[37] explicitly reaffirmed the principle of equitable and reasonable utilization, condemning its violation.

Beyond judicial practice, international organizations such as the International Law Association (ILA) and the International Law Commission (ILC) have reinforced this principle in key legal instruments, including the Helsinki Rules (1966),[38] the Berlin Rules (2004), and the 1997 UN Convention on the Non-Navigational Uses of International Watercourses.[39] These instruments establish criteria for equitable utilization, such as geographical factors, economic and social needs, population dependency, and environmental protection. Similar principles are also reflected in the 2008 Draft Articles on the Law of Transboundary Aquifers.[40]

International jurisprudence consistently emphasizes two fundamental principles:

1. No State may unilaterally divert an international river's flow without consulting and negotiating with co-riparian States.
2. Any State that interferes with a river's flow, causing harm to another State, bears responsibility for the damage.[41]

After examining the customary and treaty-based sources of this principle, it is essential to analyze its implementation in the Tigris-Euphrates river basin, shared by Turkey, Iran, Iraq, and Syria. These States are bound by international legal principles governing transboundary watercourses, and an assessment of existing legal frameworks provides the necessary basis for evaluating their obligations.

2-2. Legal Frameworks: International and Bilateral Agreements

The Ramsar Convention on Wetlands, to which all riparian States of the Tigris-Euphrates basin are parties, establishes obligations regarding the

36. Arbitral Tribunal, "Lake Lanoux Arbitration (France v. Spain)," (Arbitral Tribunal, 1957). https://leap.unep.org/sites/default/files/court-case/COU-143747E.pdf

37. International Court of Justice (ICJ), "Case Concerning the Gabcikovo-Nagymaros Project (Hungary v. Slovakia)," in Judgment of ICJ (1997). Paras 85. 147 and 150, https://www.icj-cij.org/case/92.

38. International Law Association Committee on the Uses of the Waters of International Rivers, "Helsinki rules on the uses of the waters of international rivers," (International Law Association, 1967).

39. International Law Commission, *Draft articles on the law of the non-navigational uses of international watercourses and commentaries there to and resolution on transboundary confined groundwater*, Article 5(1).

40. International Law Commission, "Draft articles on the law of transboundary aquifers," Report of the International Law Commission, sixtieth session, UN Doc A/63 10 (2008).

41. Momtaz, *ibid*.

conservation and wise use of wetlands under Article 3.2.[42] While its definition of wetlands under Article 1 does not explicitly cover international watercourses, several designated wetlands within the basin fall under its scope,[43] as recognized in the Ramsar lists of Iran, Iraq, Syria, and Turkey. This convention, despite primarily addressing wetlands, has been referenced in international jurisprudence, such as the *Costa Rica v. Nicaragua* case (2015), where the ICJ considered its provisions in an environmental dispute related to a transboundary watercourse.[44] Given that wetlands within the Tigris-Euphrates basin form an integral part of the ecosystem and are impacted by upstream water management, the Ramsar Convention may serve as a conventional source reinforcing the principle of equitable and reasonable utilization among the riparian States.

Beyond multilateral instruments, bilateral agreements between riparian States have also incorporated principles of equitable and reasonable utilization. Notably, the 1987 Turkey-Syria Protocol on Economic Cooperation[45] includes provisions on Euphrates water allocation in response to the filling of the Ataturk Dam reservoir. Under this protocol, Turkey agreed to release a minimum flow of 500 cubic meters per second at the Turkish-Syrian border, with provisions to compensate for shortfalls. Although this arrangement was temporary and did not include Iraq, the protocol acknowledged the necessity of a comprehensive allocation framework among all three riparian States. Furthermore, the agreement recognized the mutual benefits of cooperation and the need for joint technical efforts in irrigation and hydropower development. However, despite these commitments, no final agreement on Euphrates water allocation has been reached, underscoring the continued legal and political complexities surrounding equitable water governance in the basin.[46]

3. Evaluating the Application of Equitable and Reasonable Utilization in the Tigris and Euphrates River Basin

According to the concept of equitable and reasonable utilization principle

42. Ramsar Convention, "Convention on wetlands of international importance, especially as waterfowl habitat 1971 (Ramsar)," ed. Ramsar Convention on Wetlands (1971). https://www.ramsar.org/sites/default/files/documents/library/current_convention_text_e.pdf.

43. Some of the wetlands in this area have been designated in the Ramsar list of Iran (Shadegan marshes), Iraq (Hammar, Hawizeh and Central marshes), Syria (Sabkhat al-Jabbul nature reserve) and Turkey (Nemrut Caldera). Therefore, the Ramsar Convention can be addressed as one of the conventional sources of equitable and reasonable utilization since all riparian states are members to it.

44. International Court of Justice (ICJ), "Certain Activities Carried Out by Nicaragua in the Border Area (Costa Rica v. Nicaragua)," in ICJ Reports (ICJ (International Court of Justice), Paras 102-103, 106-107, 109-110, 155 and 168, 2015).

45. United Nations Office of Legal Affairs, "No. 30069. Syrian Arab Republic and Turkey," Treaty Series 1724 (1999).

46. Kirschner & Tiroch., *ibid*, 371.

and relevant factors to it, as well as discussing data about the general characteristics of the basin in the introduction section, it is necessary to evaluate the performance of States in the Tigris and Euphrates basin in terms of complying with the equitable and reasonable utilization principle. In this section, first, we raise this important issue, based on the discussed standards, of how measures of Iraq, Turkey, and Syria in the construction of various dams on the Tigris and Euphrates basin can be evaluated in terms of the equitable and reasonable utilization principle. Moreover, riparian States utilize underground water sources of the Tigris and Euphrates basin more than their capacity, and this has had a negative impact on the discharge rate of both rivers, so this calls for investigating equitability and reasonableness of such uses. Besides, measures of riparian States in the construction of dams, sub-canals and the use of underground resources have left harmful consequences on the ecosystem of the basin and existing wetlands therein.[47] Hence, a scientific and legal assessment is necessary with regard to all relevant factors to equitable and reasonable utilization, as well as to the wise use principle applicable to wetlands.

It is apparent that each riparian State, via the application of equitable and reasonable utilization, should take into account various factors as referred to technical experts. Turkey, which until 1966 used only 3% of the Euphrates for irrigation, has increased its use with the implementation of the GAP project to 50%, leaving the remainder for Syria and Iraq. The implementation of water resource development projects in Turkey has led to the loss of agricultural land in Iraq's Tigris and Euphrates basin. Approximately 1.3 million hectares of fertile agricultural land in Iraq have been affected, which accounts for 40% of Iraq's agricultural lands.[48] On the one hand, Turkey has established structures or is currently constructing, with a capacity exceeding 115 billion cubic meters in total; this is solely more than the total catchment of the two rivers, which is approximately 75 billion cubic meters.[49] On the other hand, the storage capacity of the constructed structures on the Euphrates by Turkey is 98 billion cubic meters, and this capacity alone is greater than the catchment of the Euphrates, which is equal to 25 billion cubic meters.[50]

Also, the capacity of constructed and constructing structures of Iraq on

47. Ali Navari, "The Construction and Operation of the Ilisu Dam in Turkey and the Dust Haze Phenomenon in Iran: Supremacy of Relevant Principles of International Environmental Law", *Journal of Legal Studies* 237, 10, no. 4 (2019).

48. Adamo, Al-Ansari, and Sissakian, "How dams can affect freshwater issues in the Euphrates-Tigris basins," *Journal of Earth Sciences and Geotechnical Engineering* 10, no. 1 (2020), https://www.diva-portal.org/smash/record.jsf?pid=diva2%3A1379429&dswid=-5451.

49. Hassan Partow, The Mesopotamian marshlands: demise of an ecosystem (Unep, 2001).

50. Partow, *ibid*, 5.

the Tigris is equal to 130 billion cubic meters,[51] whereas the total annual catchment of the Tigris has been estimated to be 46.4 billion cubic meters, of which 18,5 billion cubic meters flows from Turkey to Iraq, and the branches of the Tigris in Iraq generate nearly 20.6 billion cubic meters of runoff in total.[52] This indicates that Iraq has constructed twice as many structures as the total catchment of the Tigris. Besides, the capacity of constructed or constructing structures of Iraq on the Euphrates is equal to 37.6 billion cubic meters; according to its annual catchment, which is approximately 30 billion cubic meters, the capacity of constructed structures of Iraq is much more than the catchment capacity of the Euphrates.[53] However, Iraq does not play any role in providing Euphrates water resources and all its water resources are generated from Turkey and Syria, to the amount of nearly 90 per cent and 10 per cent, respectively.[54] Regarding Syria, the capacity of its constructing and constructed structures on the Euphrates is equal to 17.7 billion cubic meters.[55] And, the amount of water that this State enjoys by pumping water from the Tigris is equal to 1.250 billion cubic meters.[56]

In other words, according to the above-mentioned statistics and only since there is a possibility of harm to other riparian States, the question of violation of the equitable and reasonable utilization principle by three countries could be raised, as this issue has been emphasized by the ICJ in the *Gabcikovo-Nagymaros* case.[57] There, the Court held that "*the operation of Variant C led Czechoslovakia to appropriate, essentially for its use and benefit, between 80 and 90 per cent of the waters of the Danube before returning them to the main bed of the river, despite the fact that the Danube is not only a shared international watercourse but also an international boundary river*" reflects "*Hungary forfeited its basic right to an equitable and reasonable sharing of the resources of an international watercourse."*[58]

Supposing that Turkey does not intend to exploit the full capacity of its existing or planned hydraulic structures, an assessment of equitable and reasonable utilization must also consider a range of additional factors, including past utilization patterns, the State's need for irrigation and hydropower, the

51. Al-Ansari, N., Adamo, N., Sissakian, V., Knutsson, S., & Laue, J. (2018). Water resources of the Tigris River catchment. Journal of Earth Sciences and Geotechnical Engineering, 8(3), 37; Adamo, N., Al-Ansari, N., & Sissakian, V. (2020). How dams can affect freshwater issues in the Euphrates-Tigris basins. Journal of Earth Sciences and Geotechnical Engineering, 10(1), 51-52.

52. Mianabadi *et al*., *op cit*, 61.

53. Mianabadi *et al*., *op cit*, 71.

54. Food and Agriculture Organization of the United Nations (FAO), Transboundary River Basins–Euphrates-Tigris River Basin (2009), https://www.fao.org/aquastat/en/countries-and-basins/transboundary -river-basins/euphrates-tigris.

55. Mianabadi *et al*., *op cit*, 69.

56. *op cit*.

57. ICJ, *Case Concerning the Gabcikovo-Nagymaros Project (Hungary v. Slovakia)*, para 85.

58. *Ibid*, para 78.

socio-economic conditions of the region, climate-related pressures, demographic variables across the basin, and the proportion of each river's flow originating within the territory of each State, among others, as highlighted by experts. An important point that should be regarded here is the impact of these structures on the basin ecosystem, especially wetlands whose conservation and livelihood are dependent on the Tigris and Euphrates.[59] So, it involves taking the equitable and reasonable utilization principle into consideration, along with wise use with regard to its relevant factors.

Moreover, it should also be noted that whether the Tigris and Euphrates are treated as a single river system when they join to form the Shatt al-Arab, or considered as two independent rivers, affects how the principle of equitable and reasonable utilization is applied.[60] Turkey claims that since these two rivers join in Shatt al-Arab or Al-Tharthar Lake, they must be regarded as an integrated system.[61] But Syria and Iraq consider the Tigris and Euphrates as two separate rivers,[62] If Turkey's claim is accepted, Iraq and Syria's share of water in the Euphrates will decline.[63] Besides, Turkey aims to concentrate its development plans more on the Euphrates, due to its geographically desirable position compared to the Tigris.[64]

Under International Water Law, when two watercourses ultimately discharge into the same endpoint and maintain a degree of hydrological interconnection, they may be treated as forming a single system or a unitary basin. In other words, a shared terminus and a functional linkage can justify conceptualizing multiple rivers as one watercourse for legal purposes.[65] However, in the case of the Tigris and the Euphrates, although both empty into the Shatt al-Arab and are therefore capable of being regarded as a unitary whole, the riparian States are not legally compelled to adopt such a characterization, nor does the mere existence of a hydrological connection automatically impose unified basin management as a binding obligation.[66] Whether the two rivers should be treated as a single watercourse or as two separate systems ultimately constitutes a governance decision that requires the consent of all riparian States. The legal and practical outcome of such a

59. Navari, op cit, 228.

60. Kirschner & Tiroch., *ibid*, 376.

61. Murray Biedler, "Hydropolitics of the Tigris-Euphrates River basin with implications for the European Union," CERIS Centre Européen de Recherche Internationale et Stratégique (2004).

62. Adele J Kirschner and Katrin Tiroch, "5. Sharing and Protecting the Euphrates and Tigris: Legal Status Quo," in Water Law and Cooperation in the Euphrates-Tigris Region. Brill Nijhoff, (2013).

63. Kirschner & Tiroch., *ibid*, 88.

64. *Ibid*, 89.

65. International Law Commission (ILC), "Convention on the Law of the Non-navigational Uses of International Watercourses, 1997," (United Nations Webserver. http://untreaty. un.org/ilc/texts/instruments …, 1997).

66. Kirschner & Tiroch., *ibid*, 90.

choice affects the assessment of equitable and reasonable utilization, particularly regarding Turkey's use of the Euphrates. This is because the overwhelming majority of Turkey's planned hydraulic infrastructure under the GAP project is located on the Euphrates, where the total storage capacity reaches approximately 98 billion cubic meters, while its structures on the Tigris amount to only about 17.6 billion cubic meters. It seems that from an environmental perspective, given that the activity of the two rivers has an effect on Shatt al-Arab and the Persian Gulf, and these two form a unique river over a long distance called Shatt al-Arab, they should be regarded as an individual system.[67]

Investigating the capacity of dams constructed by Syria on the Tigris and Euphrates shows that the country has a reservoir in the Tigris just equal to 1.250 billion cm. This capacity is due to the fact that the rivers only flow across a short course in the eastern border of Syria with Turkey. Although some technical studies for the implementation of an irrigation project in the Tigris have been done recently, Syria has focused its dam construction mainly on the Euphrates, and the storage capacity of Syrian structures on this river is equal to 17.7 billion cubic meters, which forms one-third of its catchment. An important factor that should be considered about equitable and reasonable utilization by Syria is that it utilizes the underground waters of the Euphrates widely. In addition to the aforementioned, other factors, such as the dependence of the Syrian economy on agriculture and its wise use of the Euphrates for irrigation and its relatively lower population in comparison to Turkey and Iraq, should be considered. It should be noted that Iraq and Syria reached an agreement on the temporary division of the water of these two rivers in 1989 after the construction of the main dams by Syria on the Euphrates. According to this agreement, Syria was committed to releasing up to 58% of the Euphrates water toward Iraq and keeping 42% of the water for itself. It seems apparent that this bilateral agreement is not attributable to other countries. However, it can be considered when assessing equitable and reasonable utilization by Syria as a factor among others.

Looking at the capacity of constructed structures and those still under construction by Iraq indicates that it has the capacity to store 130 billion cubic meters of water on the Tigris and 37.6 billion cubic meters of water on the Euphrates, while the total storage capacity of Iraqi structures on the Tigris and Euphrates is twice the total catchment of these two rivers. Moreover, the table of annual water appropriation per capita in Turkey, Iraq, and Syria shows that the per capita share of water for Iraq, being 2,352 billion cubic meters in 1990, has declined to 1,062 billion cubic meters in 2020.[68] After the GAP Project, the water inlet rate also fell dramatically. Additionally, it is

67. *Ibid*, 90.

68. Altinbilek, *ibid*, 20.

worth noting that Iraq has historically been the main user of the Tigris and Euphrates waters.[69] Agriculture of the region has been dependent on the waters of these two rivers throughout history, and the prominent wetlands of Hawzieh, Hammar Marsh, and Central Marshes, which are dependent on the Tigris and Euphrates, are located in Iraq.[70] Besides, the inefficient water transmission systems in this country naturally lead to unprofitable use of water.[71] Accordingly, it appears that when evaluating equitable and reasonable utilization by Iraq, all factors like historical background, the needs of the population in the area, types of uses, water share of Iraq from the catchment of the two rivers, the storage capacity of constructed dams and structures, irrigation canals and inefficiency of water transmission systems should be taken into consideration. Also, the wise use principle included in the Ramsar Convention on wetlands and relevant factors to the evaluation of wise use must be taken into account when studying the effect of the amount and type of utilization by Iraq and assessing equitable and reasonable utilization.

One of the other issues in the Tigris and Euphrates river basin is the extraction of underground waters from common underground aquifer systems[72] (Ceylanpınar) and Ras-al-Ain Karst springs by Turkey and Syria, located in the southeastern part of Turkey and North of Syria, and the Khabur river, a branch of the Euphrates river basin, is recharged from these two aquifers.[73] Extraction of underground waters resulted in a decrease in the amount of discharge flow from the spring to the Khabur river, and in times of drought, like the year 2000, this amount fell to zero.[74] Thus, the utilization of the underground waters by these two countries for irrigation and the digging of a considerable number of wells, whose unofficial number is more than the official one, has affected the discharge of the Euphrates River basin.[75]

The Mesopotamian marshes, which cover more than 9,000 square kilometers, consist of three principal wetlands: the Central Marshes, the Hammar Marsh, and the Hawizeh Marsh. The Central Marshes, the Hammar Marsh, and roughly two-thirds of the Hawizeh Marsh lie within Iraqi

69. Al-Ansari, *bid*, 42.

70. UN-ESCWA, *ibid*, 116.

71. Nadhir Al-Ansari, "Management of water resources in Iraq: perspectives and prognoses," Engineering 5, no. 6 (2013), https://doi.org/https://doi.org/10.4236/eng.2013.58080.

72. Michael N Fienen and Muhammad Arshad, "The international scale of the groundwater issue," Integrated groundwater management: concepts, approaches and challenges (2016).

73. Benjamin Zaitchik, Ronald Smith, and Frank Hole, "Spatial analysis of agricultural land use changes in the Khabour river basin of northeast Syria" (paper presented at the ISPRS Commission I Symposium, 2002).

74. Banco Mundial, Syrian Arab Republic Irrigation Sector Report (World Bank, 2001).

75. Kibaroglu *et al*., *ibid*.

territory, while the remaining one-third of the Hawizeh Marsh extends into Iran.[76] Implementation of the GAP Project in Turkey and dam construction plans in Iraq and Syria have resulted in water shortages in the Mesopotamian marshes.[77] The former Iraqi government prevented the water flow from the Tigris and Euphrates river basins into these three wetlands for the conversion of these ecosystems into agricultural lands and directed water flow to arable lands by building massive canals and diverting water flow in the delta area of these rivers, before reaching these wetlands.[78] To implement these plans, political and military purposes and repression of the Shia residents around these wetlands have been followed by the former Iraqi regime.[79] These measures led to the drainage of 94 % of Hammar marsh, 97 % of central marshes and 70 % of Hawzieh.[80] Moreover, the water quality of the Shatt al-Arab decreased as a result of increased agricultural drainage of the Tigris and, particularly, the Euphrates irrigation network.[81]

Also, as a result of a decrease in the water quantity of the Shatt al-Arab from dam constructions in upstream States, and an increase in the depth of penetration of saline water into the Shatt al-Arab, most palm trees and marginal lands surrounding it have dried out.[82]

As the UN report indicates, the reasons for the water quality degradation of Shatt al-Arab have been the entry of agricultural drains of Turkey, Syria, and Iraq and decreased river water and storage of such water in constructed dam reservoirs by these three countries.[83] In other words, these countries have been the main reason behind the creation of such a situation. Additionally, due to the construction of various upstream dams in these countries and the water decline in the Shatt al-Arab, morphological changes have occurred, and subsequently, the *Talweg* line has been shifted, resulting in an increase in the costs of maintaining the line.

The Euphrates naturally becomes saline as it flows through the dry and semi-arid regions of Turkey, covering a distance of 1,500 kilometers, and passes through gypsum-rich soils in Syria, which are prone to salt

76. Ali KM Al-Nasrawi, Ignacio Fuentes, and Dhahi Al-Shammari, "Changes in Mesopotamian wetlands: investigations using diverse remote sensing datasets," Wetlands 41, no. 7 (2021).

77. Ibid, 4.

78. Hanne Kirstine Adriansen, What happened to the Iraqi Marsh Arabs and their land?: the myth about Garden of Eden and the noble savage, Danish Institute for International Studies, DIIS (2004), https://www.jstor.org/tc/accept?origin=%2Fstable%2Fpdf%2Fresrep13388.pdf&is_image=False.

79. Adamo *et al*, *ibid*.

80. Partow, *ibid.*

81. Nadhir Al-Ansari *et al*., "Water quality within the Tigris and Euphrates catchments," *Journal of Earth Sciences and Geotechnical Engineering* 8, no. 3 (2018).

82. Kirschner & Tiroch., *ibid*.

83. UN-ESCWA, *ibid.*

accumulation.[84] However, this salinity does not render the water of the Euphrates unsuitable for domestic and agricultural use.[85] Nonetheless, the direct discharge of untreated domestic and industrial wastewater into the river (such as from copper industries), along with large-scale dam construction and irrigation and drainage projects, has led to an increase in the river's salinity and the accumulation of high levels of heavy metals in aquatic organisms, which then enter the human food chain. The presence of several dams, the flow of saline water from Lake Tharthar, drainage from upstream irrigation projects, and return flows from irrigation in Iraq have significantly increased the salinity levels, making the water harmful for domestic and agricultural purposes.[86]

According to the World Health Organization standards, water salinity level exceeding 1,000 ppm is considered unsuitable for human consumption, and levels higher than 2,000 ppm are unsuitable for agricultural use. The salinity level of the Tigris in Turkey is less than 260 ppm, but it increases to 1,040 ppm at the border of Turkey and Syria, and reaches 1,000 ppm in Baghdad. In the cities of Basra and Nasiriyah in southern Iraq, the salinity levels are 2,250 and 4,000 ppm, respectively. This is due to the increased salinity from the completed irrigation from the Ilisu Dam.[87] The water salinity level in Basra reached a level that was 22 times higher than safe drinking levels in 2018, resulting in numerous animal deaths and causing severe human migration.[88]

In a comprehensive assessment, it must be noted that the catastrophic human and environmental consequences resulting from the decline in both the quality and quantity of water in the Tigris and Euphrates rivers, which stem from violation of equitable and reasonable utilization, lead us to conclude that the failure to observe procedural principles—namely, the principles of notification, negotiation and consultation, environmental impact assessment, and most importantly, cooperation, as well as the lack of clean hands among all riparian States—has resulted in the non-compliance with the substantive principles of equitable and reasonable utilization and the obligation not to cause harm. These issues underscore the urgent need for comprehensive, effective, and immediate cooperation among the riparian

84. N. Florea, and Khaled Al-Joumaa, "Genesis and classification of gypsiferous soils of the Middle Euphrates Floodplain, Syria," Geoderma 87, no. 1-2 (1998), https://doi.org/https://doi.org/10.1016/ S0016- 7061(98) 00066-4.

85. Zaitchik *et al*., *ibid*.

86. Mehmet. Irfan Yesilnacar, and Sinan Uyanik, "Investigation of water quality of the world's largest irrigation tunnel system, the Sanliurfa Tunnels in Turkey," *Fresenius Environmental Bulletin* 14, no. 4 (2005).

87. Adamo *et al*., *How dams can affect freshwater issues in the Euphrates-Tigris basins*, 74.

88. Dorith Kool, Laura Birkman, Bianca Torossian, Juliette Schaffrath, Rolien Sasse, and Susanne Schmeier, Interprovincial Water Challenges in Iraq (2020), https://hcss.nl/wp-content/uploads/ attachments/WPS-WorkingPaper-InterprovincialWaterChallenges.pdf.

States.[89]

However, given the current situation in the Tigris-Euphrates basin, where large dams have already been constructed and are operational, the application of the principle of equitable and reasonable utilization must now focus on the management and allocation of water resources. This principle necessitates that the riparian States in question, while acknowledging the existing infrastructure, seek practical mechanisms to ensure fair water distribution, minimize environmental damage, and safeguard the livelihoods of communities dependent on these rivers. In this regard, legal frameworks and international best practices—such as developing operational protocols for shared water use, establishing multilateral monitoring bodies, and adopting coordinated drought and water scarcity management policies—can play a crucial role in implementing this principle effectively.[90] For instance, regional agreements in other basins, such as the cooperative mechanisms in the Nile Basin and the Mekong River Commission, illustrate that even with the presence of large dams, structured and legally sound water-sharing arrangements can still be established.

In this context, Iraq, Syria, and Turkey must work towards creating an adaptive water management framework that adjusts water allocations based on climatic conditions, population needs, and environmental sustainability. Experiences from transboundary water management in basins such as the Jordan and St. Lawrence Rivers suggest that such frameworks can be successfully implemented through bilateral and multilateral agreements, as well as through regional or international organizations like joint river commissions. Consequently, the principle of equitable and reasonable utilization should not be viewed as a static concept limited to pre-dam construction phases but rather as a dynamic and evolving framework that guides all aspects of water governance, ensuring sustained cooperation among riparian States.

To achieve this, a combination of legal, economic, and environmental tools must be utilized. First, leveraging international legal mechanisms such as invoking binding customary principles (such as the no-harm rule and equitable and reasonable utilization) and utilizing dispute resolution mechanisms within international institutions can create legal pressure for compliance. Second, economic and political incentives—including regional coalition-building, conditional trade agreements, and diplomatic engagement through organizations like the United Nations and regional bodies—can encourage Turkey's

89. Mahnaz Rashidi, Azadeh Rastegar and Ali Mashhadi, "The Source of the Obligation to Transboundary Environmental Impact Assessment in Turkey Gap Project", *Jurisprudence and Islamic Law,* 12 22 (2021): 117-144, doi: 10.22034/law.2021.12956

90. Seyyed Ghasem Zamani and Pouya Berelian, "The Construction and Operation of the Ilısu Dam by the Turkish Government from the Perspective of International Law", *Public Law Studies Quarterly* 53, no. 4 (2023).

participation in cooperative frameworks. Third, environmental and climate-based instruments, particularly by referring to Turkey's obligations under the Paris Agreement and other environmental conventions, can serve as leverage to push for sustainable and coordinated water management policies. These combined approaches provide a realistic and actionable pathway to foster cooperation and uphold the principles of international water law in the Tigris-Euphrates basin.

Conclusion

The principle of equitable and reasonable utilization is a cornerstone of international water law, enshrined in general international law. Applying this principle to the Tigris-Euphrates basin presents considerable challenges, given the political and security complexities of the region. The unilateral actions of riparian States—such as dam construction, wastewater disposal, and large-scale irrigation projects—underscore the difficulties in reaching a comprehensive and cooperative agreement. Nonetheless, riparian States must strive for optimal and sustainable utilization of transboundary waters while considering the legitimate interests of their neighbors. Sustainability and the mitigation of environmental harm should be integral components of any water-sharing framework. Additionally, prioritization of water allocation should address the fundamental needs of human populations, ensuring access to water as a basic human right. Procedurally, equitable participation of all riparian States in decision-making processes is essential, while substantively, water allocation must reflect distributive justice by taking into account the needs and circumstances of each State.

To implement equitable and reasonable utilization effectively, several factors must be considered, including historical patterns of water use, the necessity of water infrastructure for irrigation and energy production, the socio-economic and climatic conditions of the region, population growth, and the hydrological characteristics of the basin. Special attention must also be given to the ecological impacts of dam construction, particularly concerning wetlands that depend on the Tigris and Euphrates for their survival. Incorporating the principles of wise use, established under the Ramsar Convention, can strengthen the sustainable management of these vital ecosystems.

Assessing Turkey's conduct under international water law suggests potential breaches of the equitable and reasonable utilization principle. Despite Turkey's geographical advantage as the upstream State, and its significant needs for agricultural and hydropower development, its extensive dam-building projects and excessive water storage have drastically reduced the water share by Iraq and Syria. A balanced assessment must, however, acknowledge Turkey's historically lower water consumption and legitimate

development needs. Similarly, Syria's vast exploitation of the Euphrates' groundwater resources and its reliance on the river for irrigation should be considered alongside its relatively smaller population compared to Iraq and Turkey. Iraq, as the primary downstream State, faces additional challenges, including inefficiencies in water transmission, aging irrigation infrastructure, and a high population demand for water. Evaluating Iraq's water utilization through the lens of equitable and reasonable utilization requires addressing these structural inefficiencies while ensuring fair access to water resources.

To foster a cooperative legal framework, points can be drawn from other transboundary water agreements. The Nile Basin Initiative, the Mekong River Commission, and the Jordan River agreements provide precedents for inclusive and adaptive governance structures. Diplomatic negotiations should emphasize principles of joint management, data sharing, and environmental protection, as seen in the aforementioned successful models. Iranian diplomats engaging in regional water diplomacy should advocate for a legal framework that balances national interests with basin-wide cooperation. Establishing a basin-wide legal mechanism, potentially modeled after the Indus Waters Treaty's dispute resolution framework, could provide a structured approach to resolving conflicts and ensuring sustainable water governance in the Tigris-Euphrates basin. The adoption of legally binding commitments on data transparency, environmental impact assessments, and dispute resolution mechanisms would strengthen regional cooperation and contribute to the long-term stability of water-sharing arrangements among riparian States.

Achieving equitable and reasonable utilization requires a regional legal framework, joint decision-making mechanisms, and adaptive water policies. Practical steps include:

1. Establishing a legally binding regional water agreement based on customary international law and the principles of sustainable use and no significant harm.
2. Creation of a joint water commission to monitor water flows, regulate dam operations, and facilitate dispute resolution.
3. Implementing Integrated Water Resources Management (IWRM) to improve water efficiency, irrigation practices, and environmental conservation.
4. Applying the "wise use" principle under the Ramsar Convention to protect wetlands and maintain ecological balance.
5. Enhancing diplomatic engagement with international organizations (e.g., UN, World Bank, ECO) to mobilize technical and financial support for transboundary water cooperation.

Without strong legal commitments, cooperative governance, and sustainable water management, inequitable water distribution will continue to fuel

political instability and environmental degradation. A coordinated approach that integrates legal obligations, technical innovation, and environmental protection is essential for the long-term stability of the Tigris-Euphrates basin and the welfare of the riparian States' population.

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