



ACCELERATING WATER SECURITY IN THE MENA REGION THROUGH THE EFFECTIVE IMPLEMENTATION OF THE LAW ON TRANSBOUNDARY AQUIFERS (GROUNDWATER)

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Water security is a central challenge for the development and stability of the Middle East and North Africa (MENA) region, a challenge of interest far beyond the water sector. The amplifying effects of climate change threaten to increase the gap between water supply and water demand in the region by exacerbating drought conditions. The longer-term consequences of water scarcity that increase this imbalance, extend beyond insufficient water availability. Concerns over water quality, critical water infrastructure, and transboundary water cooperation compound the region's existing socio-economic challenges. Of the 468 globally identified Transboundary Aquifers and Aquifer systems, there are over 46 of them across the MENA region, and they range in size from 340km² to 686,619km². Many groundwater Aquifers underlie two or more countries and are, therefore transboundary. Withdrawals from one country can drain life giving water from a neighbouring country and could be a potential conflict. But the Transboundary Aquifers (TBAs) have been neglected under international law until of very recent, despite their environmental, socio-economic and strategic importance. Many shared TBAs in the MENA region are under environmental threats caused by climate change, growing population pressure, over exploitation, and human induced water pollution. The dependency of the Countries in MENA region on external water resources increases the need for better and stronger regional cooperation to addressing water scarcity, sharing and water resource management. **This makes achieving water security especially challenging**, particularly, while considering that growing demand, declining water quality and climate change are contributing to increase water scarcity in the MENA region. This article therefore contends that, one surest way of addressing the lingering challenges of water security in the region, is to explore the benefits derivable from understanding the role of, and compliance with, international water law in supporting Transboundary (Groundwater) Aquifers cooperation, and accelerating the effective implementation of the law of Transboundary Aquifers (TBAs), especially in the absence of any legally binding multilateral regional cooperation agreement on TBAs (Groundwater) in the MENA region. Using doctrinal approach, the article seeks to review existing regional agreements on TBAs-Groundwater cooperation in the MENA region with a view to identifying gaps in them; explore the benefits derivable by State parties from international water law in supporting regional TBAs Groundwater cooperation; and propose how the law of TBAs can accelerate water security in the region, that apparently lacks a multilateral regional agreement on TBAs.

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1. INTRODUCTION

The Middle East and North Africa (MENA) is a diverse region¹ that benefits from a privileged geographic location access to large markets; a young and increasingly educated population; a home to some of the world’s most natural resource-endowed, and comparative advantages in several sectors such as manufacturing, renewable energy and tourism². Despite these potentials however, the MENA region is yet most vulnerable, facing water security and complex ecological and sustainability threats to its long-term security and prosperity³.

According to the United Nations Water (UN Water) water security refers to: - the capacity of a population to safeguard sustainable access to adequate quantities of acceptable quality water for sustaining livelihoods, human well-being, and socio-economic development, for ensuring protection against water-borne pollution and water-related disasters, and for preserving ecosystems in a climate of peace and political stability.”⁴

The MENA region is the most water scarce in the world. Over 60% of the region’s population lives in areas with high or very high surface water stress, compared with a global average of about 35%.⁵ The region’s current water challenges go far beyond age-old constraints of water scarcity. While the region’s scarcity challenges have been apparent for centuries, newer challenges are adding both hazards and complexity. The complexities of the water-food-energy nexus, climate change, droughts and floods,

¹ According to the United Nations Environment programme, Faith for Earth Initiative, there are multiple understandings concerning which countries constitute the MENA region, with no standardized definition. It is assumed to include 21 countries located in four sub-regions: -the Mashreq (Egypt, Iraq, Jordan, Lebanon, Palestine, Syria); the Maghreb (Algeria, Libya, Morocco and Tunisia), the Gulf Cooperation Council countries (Bahrein, Kuwait, Oman, Qatar, Saudi Arabia and United Arab Emirates), and a fourth cluster including Arab Least Developed Countries (Sudan and Yemen). The countries of Israel, Turkey and Iran generally stand separately, although sometimes, Israel and Turkey are included in Mashreq Zone. Source: - Figure 1, MENA region cited in Iyad, A and Adele G (2019): - Environmental Challenges in MENA Region. A paper presented at the University of Connecticut Workshop held in Rhodes, 23-26 June, 2019.

² See Abumoghili, I, (2019) Environmental Outlook Challenges in the West Asia Region. In Environmental challenges in the MENA Region: - The Long Road from conflict to cooperation. Pouran Hand Hakimiah, H (eds.) Gingko Library. Chapter 2, PP. 10-30.

³ See Olawuyi D.S. (2022): - Environmental Law in Arab States. Oxford University Press, Oxford, UK, p. vii.

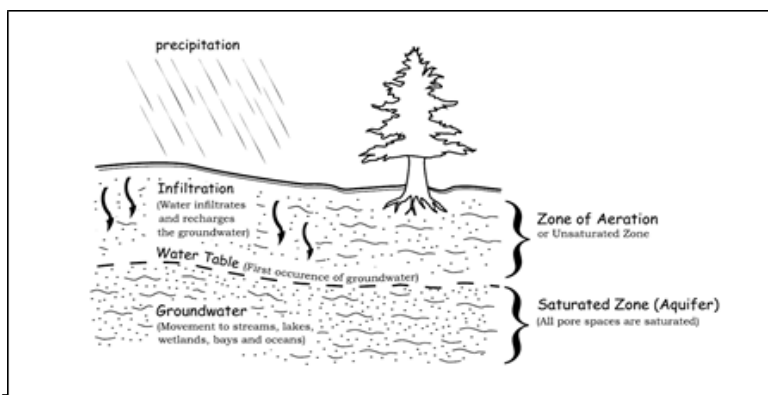
⁴ UN-Water (2013): - This is the definition proposed by the UN-Water to serve as starting point for dialogue in the UN system. www.un-water.org

⁵ Mamoud, M., (2024) The Looming Climate and Water Cases in the Middle East and North Africa. <https://carnegieendowment.org/research/2024>

water quality transboundary water management, and the management of water in the context of fragility, conflict, and violence compound the challenge of water scarcity.⁶ Meeting these challenges will depend as much on better governance of water resources as on a regional cooperative agreement (soft law or legally binding instrument),⁷ better resource endowments, infrastructure investments, and technologies, for the common benefit of all in the region.⁸

As earlier defined by the UN Water, the term water security exists, in practice, when water is effectively, sustainably and equitably managed both to leverage its productive potential and to mitigate its destructive potential.⁹ When rain falls to the ground, some of it flows along the land surface to streams, rivers or lakes, some moisturizes the ground. Part of this water is used by vegetation; some evaporates and returns to the atmosphere. Part of the water also seeps into the ground, flows through the unsaturated zone and reaches the water table, which is an imaginary surface from where the ground beneath is saturated as shown in figure 1 below. That last one is groundwater: - all water found beneath the ground surface in the saturated zone.¹⁰

Figure 1



Water table, the saturated and unsaturated zones (The importance of Groundwater): - source: - <https://www.un-igrac.org/what-groundwater,p.2>

⁶ Ibid.

⁷ UNECE, Water Convention, ESCWA and Global Water Partnership (2020): - Report of the Regional Workshop on Enhancing transboundary water cooperation in the MENA region: - Progress, challenges and opportunities. 3-4 March (2020), Beirut, Lebanon, pp.1 -10

⁸ Ibid

⁹ UN-Water, op. cit.

¹⁰ IGRAC/UNESCO: - What is Groundwater? <https://www.un-igrac.org/what-groundwater>, pp 1-10

Groundwater is contained in what are called “AQUIFERS”. An Aquifer is a geographical formation or part of it, consisting of permeable materials capable to store/yield significant quantities of water. Aquifers can consist of different materials: - unconsolidated sands and gravels, permeable sedimentary rocks such as sandstones or limestones, fractured volcanic and crystalline rocks, etc.¹¹

There are approximately 600 Transboundary Groundwaters (TBGs) in the world, including 468 recently identified Transboundary Aquifers (TBAs) and aquifer systems in 142 countries, showing that TBAs underlie almost every country in the world, or that almost every nation-state shares Groundwater resources, contained in Aquifers,¹² with neighbouring/riparian states in for example, the following river systems of the MENA region:

- a. The Nile River Basin (the Blue Nile) system involving Egypt, Sudan and Ethiopia;
- b. The Tigris-Euphrates River involving Turkey, Syria, Iraq and Iran;
- c. South-West of the Tigris-Euphrates River system is the Jordan River involving Lebanon, Syria, Jordan, Israel and Palestine (West Bank).¹³

Some key transboundary aquifers (TBAs) in the MENA region include: - the Ummer Radhuma-Dammam Aquifer system, shared between Saudi Arabia, Iraq, Kuwait and the UAE; the Wajid Aquifer system between Saudi Arabia and Yemen; the Taurus-Zagros Aquifer shared by Iraq, Iran and Turkey; the Jezira Tertiary Limestone Aquifer system between Syria and Turkey; the Saq-Ram Aquifer system shared by Jordan and Saudi Arabia; and the Coastal Aquifer Basin impacting Egypt, Israel and the Palestinian Territory.¹⁴

International Water Law¹⁵ has been developed over several decades, and binding and non-binding legal instruments have been adopted by the international community including the 1997 UN Convention on the Law of the Non-Navigational Uses of International Watercourses (the UNWC), the 1992 Convention on the Protection and Use of Transboundary Watercourses and International Lakes (The UNECE

¹¹ Ibid

¹² Ziad Khayat (2020) Overview of Transboundary Water Cooperation in the Arab region. UN-ESCWA, UNECE Report 2020, op. cit.

¹³ Ibid.

¹⁴ International Groundwater Resources Assessment Centre (IGRAC), Netherlands (2021):- Transboundary Aquifers of the World map.

¹⁵ UN-Water (2020): -The UN Global Water Conventions: Fostering Sustainable Development and Peace. PP. 1-34. UN-Water, Geneva, www.unwater.org.

Convention), and the 2008 Draft Articles on the Law of Transboundary Aquifers (TBAs)¹⁶.

The response of countries in the MENA region to the UN Transboundary Water Conventions reveals the following trend: - a) the 1997 UNWC ratified by 9 countries: - Syria, Jordan, Lebanon, Libya, Iraq, Qatar, Tunisia, Morocco and Palestine; b) the UNECE Convention of 1992, 5 countries have indicated interest in acceding to it: - Iraq, Jordan, Lebanon, Palestine and Tunisia¹⁷.

It is against this background that this lecture seeks to (1) review existing international and regional legal instruments on transboundary water and aquifers management and cooperation relevant to the MENA region and (2) Explore the guidance provided by the 2008 UN General Assembly Resolution and its Draft Articles on the Law of Transboundary Aquifers for developing cooperation and joint management of TBAs (Groundwater) as vital resources; and to conclude with recommendations for the MENA region member states.

2. KEY ELEMENTS OF WATER SECURITY AND TRANSBOUNDARY AQUIFERS IN THE MENA REGION

2.1 Key Elements of Water Security¹⁸

As revealed by figure 2 below, the key elements of water security are: -

- **Availability:** - The physical presence of enough water resources to meet demand (sufficient quantity);
- **Access:** - The ability to reliably obtain water, considering factors like infrastructure and distribution systems (reliable water supply);
- **Safety:** - Ensuring water quality is free from harmful contaminants and pathogens (clean and pollution-free)
- **Affordability:** - The cost of water being reasonable for all members of a community (reasonable cost);
- **Sustainability:** - Managing water resources to ensure their long-term availability without compromising present and future generations (managing resources for long term use)¹⁹.

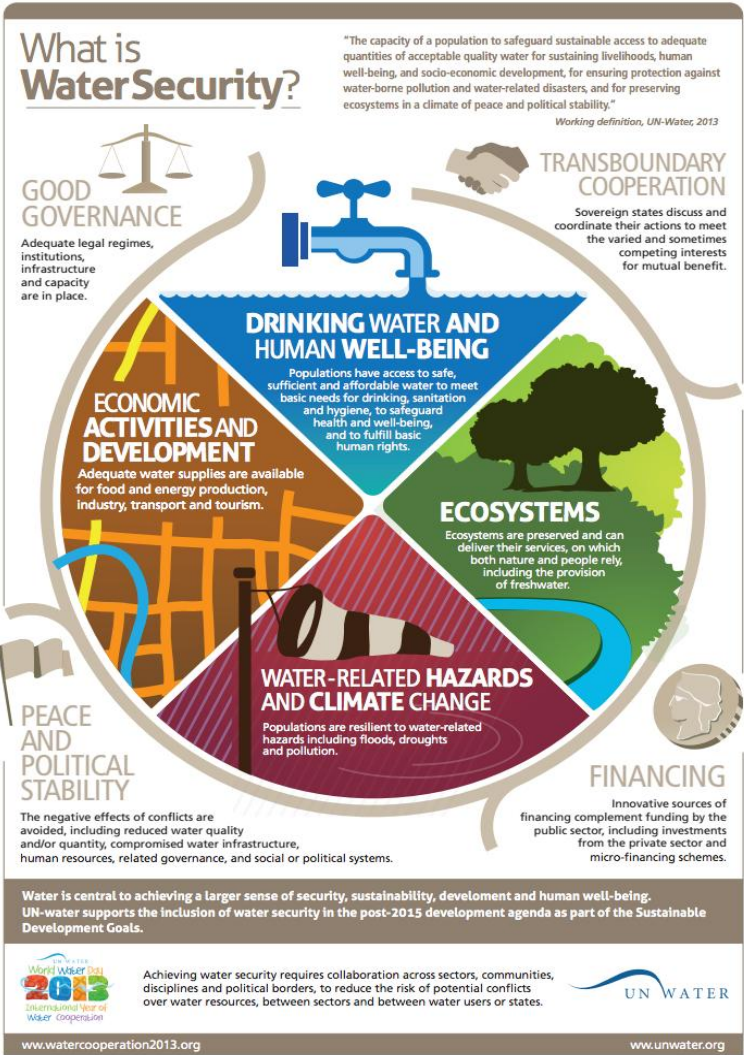
¹⁶ UNEP, Nairobi: - The Greening of Water Law:- Managing Freshwater Resources for People and Planet, pp. 1-124. www.unep.org.

¹⁷ Ziad, K, op. cit.

¹⁸ UN-Water, op.cit.

¹⁹ Ibid.

FIGURE 2



version October 2013

2.2 Significant nexus between Transboundary Aquifers (TBAs) and Groundwater: - Key elements of TBAs

A transboundary aquifer is simply a groundwater aquifer that extends across international borders; meaning the nexus between groundwater and TBA lies in the fact that a shared groundwater source exists beneath the borders of multiple countries, making its management and usage a complex issue requiring international cooperation to ensure equitable access and avoid conflicts over water extraction²⁰.

There are three key elements of this nexus: -

- i. **Impact of extraction:** - when one country pumps groundwater from a TBA, it can significantly lower water levels in neighbouring countries, impacting their access to the same water source;
- ii. **Hydrological connection:** - The flow of groundwater within an aquifer doesn't follow political boundaries meaning actions taken in one country can directly affect water availability in another;
- iii. **International cooperation:** - To manage transboundary aquifers effectively, countries must collaborate through legally binding treaties or agreements to monitor water levels, establish sustainable extraction rates, and address potential disputes.

There are three key examples of challenges related to transboundary aquifers²¹: -

- i. **Data sharing:** - Accurate information about the aquifer's characteristics and water flow is crucial for equitable management, but data sharing between countries can be a big hurdle;
- ii. **Water allocation:** - Determining fair water allocation among countries sharing an aquifer can be complex, especially when water needs vary;
- iii. **Environmental concerns:** - Over-extraction from a transboundary aquifer can lead to environmental degradation, such as saltwater intrusion in coastal areas.

²⁰ Geert, J. N., Greg, C, Gaye, C.B, Karen, G. V, and Braune, E. (2018):- Transboundary Aquifers of Africa: - Review of the current state of Knowledge and progress towards sustainable development and management. In Journal of Hydrology: - Regional Studies, Elsevier B.V. (<https://doi.org/10.1016/J.ejrh.2018.03.004>).

²¹ Ladan, M. T. (2012): - The Unique situation of Transboundary Aquifers in Africa: - Meeting the Challenges of the UN General Assembly Resolution on the Law of Transboundary Aquifers. NIALS Journal of Environmental Law, NJEL, Vol 11, 2012, at pp. 236-256. Nigerian Institute of Advanced Legal Studies, Abuja.

3. TRANSBOUNDARY AQIFERS AND REGIONAL INITIATIVES FOR WATER RESOURCE MANAGEMENT AND COOPERATION IN THE MENA REGION.

To be able to store and yield groundwater, an aquifer needs to have certain physical characteristics. It needs to have an empty space (pores or fractures) where groundwater can be stored and the spaces need to be connected to allow it to flow through. The greater the aquifer's porosity and permeability are, the more groundwater is stored and yield by an aquifer²².

Some key transboundary aquifers in the MENA region include the following shown on Table 1.

Table 1: - TBAs in the MENA Region²³

SN	Aquifer Name	Sharing Countries
1	Nubian Sandstone Aquifer System (NSAS)	Egypt, Libya, Sudan and Chad
2	Ummer Radhuma-Dammam Aquifer System	Saudi Arabia, Iraq, Kuwait and the UAE
3	Wajid Aquifer System	Saudi Arabia and Yemen
4	Taurus-Zagros Aquifer	Iraq, Iran and Turkey
5	Jezira Tertiary Limestone Aquifer System	Syria and Turkey
6	Saq-Ram Aquifer System	Jordan and Saudi Arabia
7	Coastal Aquifer Basin	Impacting Egypt, Israel and the Palestinian Territory
8	Northwest Sahara Aquifer System (NWSAS)	Algeria and Libya
9	Systeme Aquifer de Tindouf	Morocco, Algeria, Mauritania and Western Sahara
10	Taoudeni Basin	Algeria, Mauritania and Mali

Due to their transboundary nature, these aquifers can be source of conflict or tension between neighbouring countries, especially when water scarcity is a concern. International cooperation is crucial for effective monitoring and sustainable management of these shared water sources²⁴. While figure x below reveals aquifer names, sharing countries and areas covered by km², Figure xx shows TBAs in the

²² Ibid.

²³ IGRAC (2021) op. cit

²⁴ Ladan, M. T. (2012) op. cit.

Middle East and overlapping areas , and Figure xxx depicts the underlying and overlapping shared aquifer systems in the MENA region.

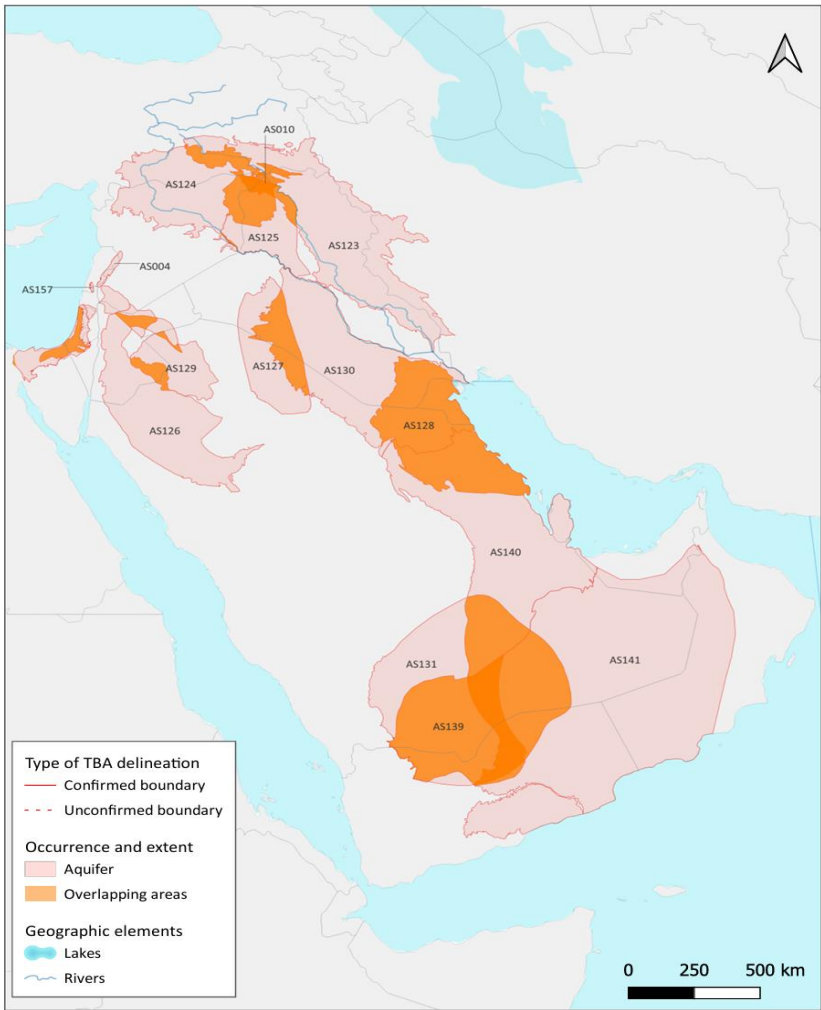
FIGURE X: - AQUIFER NAMES AND COVERAGE

<u>Aquifer Code</u>	<u>Aquifer Name</u>	<u>Sharing Countries</u>	<u>Area (km²)</u>
AS001	Western Aquifer Basin	Egypt, Israel, Palestinian Territory	12313
AS002	Coastal Aquifer Basin	Egypt, Israel, Palestinian Territory	18945
AS003	Northeastern Aquifer	Israel, Palestinian Territory	1245
AS004	Anti-Lebanon	Lebanon, Syria	3061
AS010	Upper Jezira	Iraq, Syria, Turkey	10294
AS123	Taurus-Zagros	Iran, Iraq, Turkey	207478
AS124	Jezira Tertiary Limestone Aquifer System	Syria, Turkey	130779
AS125	Neogene Aquifer System (North-West): Upper and Lower Fars	Syrian Arab Republic, Iraq	66266
AS126	Saq-Ram Aquifer System (West)	Jordan, Saudi Arabia	151718
AS127	Wasia-Biyadh-Aruma Aquifer System (North): Sakaka-Rutba	Saudi Arabia, Iraq	84212
AS128	Neogene Aquifer System (South-East): Dibdibba-Kuwait Group	Iraq, Kuwait, Saudi Arabia	148313
AS129	Tawil Quaternary Aquifer System: Wadi Sirhan Basin	Jordan, Saudi Arabia	45638
AS130	Umm er Radhuma-Dammam Aquifer System (North): Widyah-Salman	Iraq, Kuwait, Saudi Arabia	242966
AS131	Wajid Aquifer System	Saudi Arabia, Yemen	370578
AS139	Wasia-Biyadh-Aruma Aquifer System (South): Tawila-Mahra/Cretaceous Sands	Saudi Arabia, Yemen	157061
AS140	Umm er Radhuma-Dammam Aquifer System (Centre): Gulf	Saudi Arabia, United Arab Emirates, Bahrain, Qatar	291613
AS141	Umm er Radhuma-Dammam Aquifer System (South): Rub' al Khali	Oman, Saudi Arabia, United Arab Emirates, Yemen	686619
AS142	Basalt Aquifer System (West): Yarmouk Basin	Jordan, Syria	6873
AS143	Basalt Aquifer System (South): Azraq-Dhuleil Basin	Jordan, Syria	8457
AS157	Ecocene Aquifer	Lebanon, Palestinian Territory	340

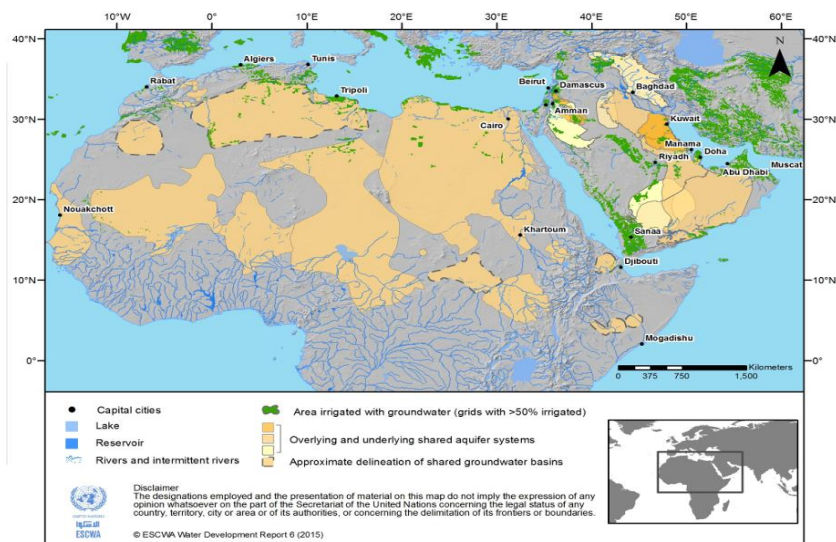
Source: - IGRAC, Netherlands (2021) TBAs of the World Map: - Middle East.

FIGURE XX: - TRANSBOUNDARY AQUIFERS OF THE MIDDLE EAST

Transboundary Aquifers of the Middle East



Source: - IGRAC, Netherlands, 2021

FIGURE XXX

The Nubian Sandstone Aquifer System (NSAS) is the most prominent TBA in the MENA region, covering a large area across multiple countries and providing a substantial water source. The NSAS extends across Egypt, Libya, Sudan and Chad, making it a vital resource for these nations. The MENA region is characterized by a high level of water scarcity, making TBAs like NSAS even more crucial for water security. Due to over-dependence on these shared aquifers, over-extraction by one country can significantly impact water availability for others, leading to potential conflict.²⁵

Besides the NSAS, other important TBAs in the region include coastal aquifers, which can be impacted by saltwater intrusion due to over-extraction. Challenges exist in monitoring the state of these aquifers and sharing data among the riparian states, which is essential for sustainable management. Effective management of TBAs requires robust international cooperation and agreements between affected countries to ensure equitable water allocation²⁶.

²⁵ Osman, M. A. A., et al (2024): - Enhancing water Sustainability in North Africa: - Literature Review and Synthesis of Current knowledge Gaps in Sudan. Department of Biological systems Engineering: - Conference Presentations and White Papers, 80, pp.1-13, University of Nebraska-Lincoln.

²⁶ Ibid.

3.1 INTERNATIONAL AND REGIONAL LEGAL INSTRUMENTS ON TRANSBOUNDARY WATER AND AQUIFERS MANAGEMENT AND COOPERATION: - ROLE IN SUPPORTING REGIONAL TRANSBOUNDARY WATER MANAGEMENT IN THE MENA REGION

Recognizing the importance of transboundary water cooperation for sustainable development and peace, the UN Secretary General has, in recent years, repeatedly called upon all countries to accede to the UN Global Water Conventions: - the Convention on the Protection and Use of Transboundary Watercourses and International Lakes (the Water Convention) 1992; and the Convention on the Law of the Non-Navigational Uses of International Watercourses (the Watercourses Convention) 1997. He also requested the whole UN system join forces to support countries in acceding to and implementing them.²⁷ Similar calls to strengthen transboundary water cooperation on the basis of international water law are found in the reports of the high-level Panel on Water, and High-level Panel on Water and Peace.²⁸

In the MENA region, several bilateral treaties have been adopted for the Nile, Tigris and Euphrates river basins, but no comprehensive regional treaty exists involving all the neighbouring states sharing these river basins. The situation is even worse for transboundary aquifers (TBAs), as very few shared groundwater agreements have been adopted globally.²⁹ One successful example is the Agreement on the Nubian Sandstone Aquifer System (NSAS) shared between Libya, Egypt, Chad and Sudan. This treaty is titled 'Agreement on the Constitution of the Joint Authority for the Study and Development of the NSAS waters'. All the nations sharing the aquifer are parties to the agreement which establishes a joint authority for the management of the aquifer.³⁰ However, regional transboundary water treaties are not the norm in regional practice.³¹

In 2008, the international community adopted a non-binding instrument titled, Draft Articles on the Law of Transboundary Aquifers (Draft Articles).³² The 1997 UNWC or the Watercourses Convention covers both shared surface water and ground-water, but excludes from its scope transboundary aquifers (TBAs) that are not connected to surface waters.³³ On the other hand, the 1992 UNECE Convention or the Water Convention covers all types of shared surface water and groundwater,³⁴ while the 2008 Draft Articles solely addresses TBAs.³⁵

²⁷ UN-Water (2020), op. cit.

²⁸ Ibid.

²⁹ Ladan, M.T. (2012), op. cit.

³⁰ Osman (2024), op cit.

³¹ Ladan, M.T. (2012) op. cit.

³² Ibid

³³ UNEP, The Greening....., op. cit.

³⁴ Ibid

³⁵ Ladan, M. T., op. cit.

3.1.1 The Draft Articles on the Law of Transboundary Aquifers³⁶

TRANSBOUNDARY AQUIFERS, INTERNATIONAL LAW AND THE ROLE OF THE UNITED NATIONS GLOBAL WATER CONVENTIONS

Under increasing demand, groundwater constitutes a vital reserve of freshwater for 2.5 billion people worldwide. While the 600 transboundary aquifers presently identified by UNESCO-IHP underlie almost every nation, research, practice, and legislation has traditionally focused much more strongly on surface waters. The international legal regime of transboundary groundwater resources, including binding and non-binding instruments of international law, presents significant gaps and shortcomings. Bilateral and multilateral agreements have, for instance, quite exceptionally been concluded solely for trans boundary aquifers.

In 2008, the United Nations International Law Commission (ILC), with scientific and technical support from UNESCO-IHP, adopted 19 Draft Articles on the Law of Transboundary Aquifers as a contribution to the development of guiding international groundwater law (International Law Commission, 2008). As a testament to the continued interest in the topic of transboundary aquifers by Member States, the General Assembly adopted in 2011, 2013, and 2016, three subsequent Resolutions on the Law of Transboundary Aquifers. The articles, relevant to all aquifers and the groundwaters they contain, attempt to fill a 'gap' left by the Watercourses Convention, which deals with groundwater only insofar as it is connected to shared surface water bodies, and also aims to adjust general international water law to the special case of groundwater – for instance, a resource characterized by long 'reaction' time periods in response to external pressures, and by (often) large volumes of stored water, which are dependent on recharge processes. Building on the Draft Articles, the Parties to the Water Convention, also adopted in 2012 a set of non-binding Model Provisions on Transboundary Groundwaters, which much like the ILC Draft Articles, provide guidance to Parties in applying the Water Convention to transboundary aquifers, and offer commentaries to the provisions that give practical guidance and examples of their potential application. Both the ILC Draft Articles and the Model Provisions provide a basis on which specific groundwater agreements could be developed by States, either in the form of an additional protocol to an existing water agreement, or in the form of a transboundary water agreement focusing on groundwater or addressing groundwater along with surface waters. Additionally, in both the Draft Articles and the Model Provisions, the principles of 'equitable and reasonable utilization' and 'no significant harm' are both tailored to the unique characteristics of groundwater resources. As with the Water Convention's Model Provisions, the Draft Articles pay more attention to factors for assessing what constitutes 'equitable and reasonable utilization' and includes 'the natural characteristics of the aquifer or the aquifer

³⁶ Ibid

system' and 'the role of the aquifer or aquifer system in the related ecosystem' (Arts. 5(1) (c),(d), and (i)); whereas the Water Convention's Model Provisions sets out several aquifer-specific 'appropriate measures to prevent significant harm', such as the establishment of protection zones in the most vulnerable or critical parts of the recharge area of groundwaters (Provision 5(2)).

The international legal regime for the management and use of transboundary groundwaters is still evolving, and there are significant opportunities for progress. New or more recent international agreements and growing international interest in groundwater also shed light on the evolution of trends in customary international law. In this context, there is a need to further test and develop existing legal frameworks for transboundary groundwater and linked surface water-groundwater systems, as well as to strengthen and develop more specific cooperation focusing on transboundary aquifers.

The United Nations global water conventions, supplemented by the Draft Articles and Model Provisions, can help develop these legal frame works for transboundary groundwater. Additionally, by joining the Water Convention, countries gain access to a valuable forum or 'community of Parties', and an institutionalized platform for cooperation, providing fertile ground to: improve the groundwater-specific, science-based policy dialogue; dedicate enhanced attention to the needs of transboundary aquifers (legal and otherwise); and observe and constructively discuss the evolution of accepted State practice regarding the shared use and management of transboundary aquifers.

3.1.2 A New Strategy for the Water Security and Shared Transboundary Water Resources Cooperation in the MENA Region

Recent findings³⁷ have shown that a new strategy for water security in the region was advocated by the Arab Ministerial Water Council (AMWC) in 2010 following the adoption of a resolution that emphasized the need to adopt a regional transboundary water treaty to ensure peace and to address the challenges of water scarcity, the dependence on freshwater resources originating from outside the region, the threats emerging from climate change that affect the existing limited water resources, and the need to adopt an integrated water resource management and cooperation approach. The AMWC has issued several decisions³⁸ addressing shared freshwater resources, including its decision to prepare the Draft legal framework on Shared Water Resources in the Arab region (the Draft Arab Water Convention).

Recent findings show that, after the 2011 first draft, the AMWC decided to limit the scope of this instrument to shared groundwaters. In 2012, it reverted to the original idea

³⁷ Imad, A. I (2022):- Draft Legal Framework for Shared Water Resources in the Arab World: - is it Really needed? Water International, Vol. 47, No. 4, at 512-539. Routledge-Taylor and Francis.

³⁸ Ibid.

of having a regional instrument covering transboundary groundwater and surface waters. The most recent version of the Draft Arab Water Convention, includes the main principles of international water law and has many similarities to the water Courses Convention, UNWC adopted in 1997. Numerous disagreements persist between the Arab States concerning various provisions of the final draft, and in 2016, these led to the AMWC to postpone any decision concerning the fate of the draft until more favourable conditions appeared.³⁹ The AMWC instead prepared a non-binding instrument titled, “Common Guiding Principles for Cooperation’ to support collaboration among Arab states. These guiding principles represent a first step towards regional Arab transboundary cooperation over shared freshwater resources, in the hope that future steps, including a regional legally binding treaty, can follow.⁴⁰

The 2010 – 2030 Arab Water Security Strategy (AWSS)⁴¹ aims at guiding joint Arab actions to ensure sustainable use of water resources in the Arab States and to pave way for necessary actions till 2030. It includes a set of key objectives grouped under three main headings: - The economic and development field, the institutional, human and technical capacity development, and the political component, especially in relation to the protection of Arab rights in cases of water under occupation or shared and transboundary water resources. successful practices showed that the strategy requires upscaling preparation of integrated regional-national-community projects to attract funding agencies and to meet with the increasing water scarcity challenges in the region. Reviewing the strategy showed that it requires more focus on the following aspects: - water governance for social and economic challenges (poverty reduction, unemployment, gender equality and displacement, migration and conflicts); Groundwater for Sustainable Development; Water pricing for a dry future; etc.⁴²

The Draft Arab Water Convention provides for its scope of coverage to be both shared surface and groundwater; a general obligation to cooperate; the regular exchange of data and information; planned measures; equitable and reasonable utilization; an obligation not to cause significant harm; the protection of the environment, including the ecosystems and the prevention, reduction and control of pollution, emergency situations; settlement of disputes; water in occupied territories; and institutional arrangements. Hence it covers both substantive and procedural provisions.⁴³

The scope of the Draft Convention covers definitions of key terms such as: - shared aquifer; shared water resources; shared drainage basins; groundwater and surface water as well as pollution. A shared aquifer means a ‘permeable water bearing geological formation extending between two or more Arab states and underlain by a less

³⁹ Ziad, K (2020), op. cit.

⁴⁰ Ibid.

⁴¹ Arab Ministerial Water Council, Cairo (2012) Arab Strategy for Water Security in the Arab Region to Meet the Challenges and Future Needs for Sustainable Development, 2010-2030, PP. 1-21.

⁴² Ibid.

⁴³ Imad, op. cit.

permeable layer'. And that Groundwater means 'water contained in an aquifer, whether or not the aquifer receives significant contemporary water recharge'. By defining key terms like Groundwater and Aquifers, the Draft Convention makes a step forward in comparison to the 2008 Draft Articles on the Law of Transboundary Aquifers (TBAs), which were criticized for focusing only on the term aquifer without mentioning groundwater at all.⁴⁴

Nevertheless, the drafters of the Draft Arab Water Convention acknowledged the importance of the 2008 Draft Articles on the Law of TBAs, even though it is a non-binding instrument in international water law, for guidance in the negotiation and drafting of shared regional transboundary water cooperation, especially the TBAs, among all the riparian states.⁴⁵

3.1.3 Meeting the Challenges of the UNGA Resolution on the Law of Transboundary Aquifers (TBAs)⁴⁶

With growing pressure placed on groundwaters in general, and on transboundary aquifers in particular, plus, given their importance for the planet as a whole, there is a need and a demand for a regulatory framework developing cooperation and joint management of this precious resource. New questions are being raised in the international arena concerning the use and protection of Transboundary groundwater resources. These questions have been addressed in the draft articles on the law of transboundary aquifers. A UN General Assembly Resolution (A/RES/63/124) was adopted in December 2008, including the draft articles as an annex and encouraging States sharing an aquifer to consider them when entering an agreement for the proper management of the underground resources.⁴⁷

The Resolution constitutes a step forward in the progress of international water law on Transboundary aquifers and represents a reference for States, as well as for water experts and managers.

Meeting the above challenge requires Aquifer states to observe and respect the following general principles of the draft codified law on TA.

Under Article 3, each Aquifer State has sovereignty over the portion of a transboundary aquifer or aquifer system located within its territory. It shall exercise its sovereignty in accordance with international law and the present draft articles.

⁴⁴ Ibid.

⁴⁵ Ibid.

⁴⁶ Ladan, M. T., *op cit*.

⁴⁷ UN Gen. Ass. Resolution (A/RES/63/124, December 2008).

Under Article 4, aquifer States shall utilize transboundary aquifers or aquifer systems according to the principle of equitable and reasonable utilization, as follows:

they shall utilize transboundary aquifers or aquifer systems in a manner that is consistent with the equitable and reasonable accrual of benefits therefrom to the aquifer States concerned;

they shall aim at maximizing the long-term benefits derived from the use of water contained therein;

they shall establish individually or jointly a comprehensive utilization plan, taking into account present and future needs of, and alternative water sources for, the aquifer States; and

they shall not utilize a recharging Transboundary aquifer or aquifer system at a level that would prevent continuance of its effective functioning.

Under Article 6 (1) Aquifer States shall, in utilizing transboundary aquifers or aquifer systems in their territories, take all appropriate measures to prevent the causing of significant harm to other Aquifer States or other States in whose territory a discharge zone is located. (3) Where significant harm nevertheless is caused to another aquifer State or a State in whose territory a discharge zone is located, the aquifer State whose activities causes such harm shall take, in consultation with the affected State, all appropriate response measures to eliminate or mitigate such harm, having due regard for the provisions of draft articles 4 and 5.

Under Article 7 (1) Aquifer States shall cooperate on the basis of sovereign equality, territorial integrity, sustainable development, mutual benefit and good faith in order to attain equitable and reasonable utilization and appropriate protection of their Transboundary aquifers or aquifer systems. (2) for the purpose of paragraph 1, aquifer States should establish joint mechanisms of cooperation.

Under Article 9, for the purpose of managing a particular transboundary aquifer or aquifer system, aquifer States are encouraged to enter into bilateral or regional agreements or arrangements among themselves. Such agreements or arrangements may be entered into with respect to an entire aquifer or aquifer system or any part thereof or a particular project, programme or utilization except insofar as an agreement or arrangement adversely affects, to a significant extent, the utilization, by one or more other aquifer States of the water in that aquifer or aquifer system, without their express consent.

The Tripoli III 2008 Conference Resolution considered below is quite encouraging on managing shared aquifer resources in Africa⁴⁸.

More than 150 participants from more than 20 countries and national, regional and international organizations and Associations attended the international Conference on “Third International Conference on Managing shared aquifer resources in Africa” Tripoli, 25-27 of May 2008, and formulated, *inter alia*, the following conference Statement: -

We call for further actions that encourage the joint, sustainable management of aquifers shared by countries in Africa, and,

Call on national governments to facilitate Transboundary aquifer management through appropriate regulatory and administrative arrangements at domestic level;

Call on bilateral, multilateral financial institutions to reinforce their long term support to Countries and regional organizations in their development of groundwater for their national economic development, including providing the necessary funds for resource exploration, evaluation and sound data collection to fill in data gaps leading to knowledge based sound management practices;

Call on governments to enhance and provide sustainable integrated shared surface and ground water resource management in view of maximizing benefits to people and ecosystems;

Call for partnerships with industry, especially the mineral development, oil and gas sectors, to participate in identification and use of productive aquifers that could contribute to poverty alleviation, human development and environmental sustainability;

Call upon UNESCO (ISARM- Africa) and GEF International Waters to continue and reinforce their programme, and deploy a long term effort in support of the sustainable management of shared aquifer resources of Africa⁴⁹.

4.0 ACCELERATING A REGIONAL WATER COOPERATION AGREEMENT ON SHARED TRANSBOUNDARY AQUIFERS (TBAS) AND WATER SECURITY IN THE MENA REGION

To accelerate a regional agreement on shared transboundary aquifers in the Middle East and North Africa (MENA) region, key strategies include: Reactivate the Draft water convention by addressing all the outstanding issues and re-table for wide stakeholder consultation and adoption for greater security and welfare of all the people in the

⁴⁸ The Tripoli III Conference Resolution, May 25-27, 2008, <http://www.isram.net/publications/298>.

⁴⁹ Ibid

MENA Region, building political will through high-level engagement, prioritizing scientific data collection and sharing, fostering inclusive stakeholder participation, utilizing international frameworks and technical support, and addressing concerns through equitable water allocation mechanisms while simultaneously building capacity for sustainable water management practices across the region⁵⁰.

Key strategies:

A. Political and Diplomatic Strategies:

High-level leadership commitment: Secure strong political backing from regional leaders to prioritize transboundary water cooperation and establish a dedicated high-level forum for dialogue and decision-making.

Regional diplomacy Initiatives: Leverage existing regional organizations like the Arab League to facilitate dialogue and promote consensus building on water sharing agreements. International engagement: Seek support from international organizations like UN Water, UNESCO, and the World Bank to provide technical expertise and financial assistance.

B. Technical and Scientific Strategies:

- Joint data collection and analysis: Establish a collaborative framework for comprehensive data collection on shared aquifers, including hydrogeological studies, modeling, and monitoring systems.
- Scientific capacity building: Enhance technical expertise within participating countries through training programs, workshops, and knowledge exchange initiatives focused on transboundary aquifer management.
- Transparent information sharing: Develop a system for open and regular data sharing among all stakeholders to promote trust and informed decision-making.

C. Stakeholder Engagement and Consensus Building:

- Inclusive stakeholder participation: Engage a wide range of stakeholders including government officials, water experts, local communities, civil society organizations, and private sector actors in the decision-making process.

⁵⁰ Ladan, M. T.'s recommendations (2025): - Paper presented at the 6th Scientific Conference of ASSELLMU, Riyadh, Saudi Arabia, 24-25 February 2025: - Accelerating Water Security in the MENA region Through the Effective Implementation of the Law on Transboundary Aquifers (Ground-water), pp.1-20.

Community awareness campaigns: Raise public awareness about the importance of transboundary water cooperation and the potential impacts of unsustainable water usage.

Conflict resolution mechanisms: Establish effective dispute resolution mechanisms to address potential conflicts arising from water sharing issues.

D. Legal and Institutional Frameworks:

Development of a regional water convention: Draft a legally binding regional agreement outlining principles for equitable water allocation, data sharing, and dispute resolution mechanisms based on international water law.

Joint management bodies: Establish transboundary aquifer management institutions with representative participation from all affected countries to oversee implementation of the agreement.

Capacity building for implementation: Provide training and technical support to national institutions responsible for managing transboundary water resources.

E. Addressing Specific Challenges:

Water scarcity mitigation: Promote water conservation measures, desalination technologies, and efficient water use practices to address growing water demand.

Climate change adaptation: Integrate climate change projections into water management plans to ensure long-term sustainability of shared aquifers.

Financial sustainability: Explore innovative financing mechanisms, including donor funding and regional water funds, to support implementation of the agreement.

5.0 CONCLUSION

A transboundary aquifer does not have any particular behavior with regards to the effects of water abstraction. A transboundary aquifer differs from a national aquifer in the management issues resulting from the international character of the problems created by the resource partition and specifically from the economic, social and physical disparities between the countries concerned.

Although a joint management of transboundary aquifers through bi- or multi-lateral agreements is highly desirable in all circumstances, there are still a number of issues and principles to be discussed and agreed, on which to base high level technical and political dialogue:

First is the availability of high quality information on the functioning of the groundwater systems, able to simulate development scenarios and to predict their

medium and long term effects in term of natural outflow, environmental impact, water level and water quality change;

Second is setting up of an information exchange mechanism on groundwater development processes in each country and local (within the country) effect of such development.

Third is establishing partition rules to be specified and approved by all parties, based on (1) The principle of unity of an aquifer system mainly for renewable resources aquifers: the location of major recharge areas in one country does not confer major water rights to this country; and (2) the principle of equivalence of effects: when possible, the physical and economic effects of a water extraction programme in a country A to the nearby country B should be equivalent to the effects of country B's programme to country A.

Finally, the role of international law in this regard is to provide for the general principles of equitable and reasonable utilization of transboundary Aquifers and to set out obligations for the protection and preservation of ecosystems as well as the management of water resources for the common good of all.