

# LEGAL PRINCIPLES FOR THE OPTIMAL EXPLOITATION OF GROUNDWATER RESOURCES IN PUBLIC INTERNATIONAL LAW

SOFIA CHERAD <sup>1</sup>, INES REKIK <sup>2</sup>, SAFA BEN MOUSSA <sup>3</sup>, AHLAM HARRACHE <sup>4</sup>,

[1soufiacherrad@univ-biskra.dz](mailto:soufiacherrad@univ-biskra.dz)

University Mohamed Khider Biskra (Algeria)

[2ines.rekik@univ-biskra.dz](mailto:ines.rekik@univ-biskra.dz)

University Mohamed Khider Biskra (Algeria)

[3benmoussa-safa@univ-eloued.dz](mailto:benmoussa-safa@univ-eloued.dz)

Public Policy and Public Service Improvement Laboratory in Algeria

University of El-Oued (Algeria)

[4Harrache-ahlam@univ-eloued.dz](mailto:Harrache-ahlam@univ-eloued.dz)

Laboratory of International Legal Transformations and Their Impact on Algerian Legislation

University of El-Oued (Algeria)

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## **Abstract**

This study addresses the legal principles for the optimal exploitation of groundwater resources in public international law. Given the importance of this important resource as one of the world's most important freshwater resources, and the increasing scarcity of freshwater on planet Earth, the potential for international conflicts over the ownership of these resources has become one of the greatest risks the world could face.

As a result, international initiatives have emerged aimed at establishing basic principles regulating the utilization and exploitation of international groundwater shared by states, beginning with the Helsinki and Belden Principles and culminating in the 2008 Aquifer Law Draft.

**Keywords:** Water, legal principles, groundwater, aquifers, freshwater, international law.

## **INTRODUCTION:**

Water has been, and continues to be, a source of conflict and disputes since ancient times, as it is the foundation of life. With the scarcity of financial resources, especially freshwater resources, countries have begun to cooperate to secure other water resources to meet their needs, the most important of which is groundwater.

Given that groundwater is one of the most important water resources in the world, international conflicts have emerged over the exploitation and use of international groundwater networks. This has prompted the international community to move to establish international principles and rules to regulate these resources and protect them from the dangers and violations that pollute them and infringe upon the rights of neighboring countries.

The challenge facing the international community in our contemporary era is the search for international rules and principles that regulate the exploitation and use of groundwater, on the one hand, and contribute to ensuring the stability of international legal relations, on the other. What are the international legal principles that protect and develop these water resources?

To answer the aforementioned problem, we adopted a descriptive and analytical approach, which seeks to collect various legal texts relevant to the topic and analyze them in a manner consistent with international legal requirements.

### **Axis One: The Concept of Groundwater:**

Freshwater scarcity and misuse pose a serious and growing threat to sustainable development and environmental protection. Human health and well-being, food security, industrial development, and the ecosystems that depend on them are all at risk unless water and land resources are managed more effectively this decade and beyond than in the past. (Dublin Statement 1992)

#### **First: Definition of Groundwater:**

Groundwater constitutes a vast natural reservoir of fresh water located underground or between rocks and soil. It forms a natural reservoir of rainwater that falls during wet times and is partially drained during dry periods. This water is represented by melted snow and rainwater, which are among the most important sources of groundwater. (Sayyid Abd al-Nabi Muhammad 2019)

The draft law on transboundary aquifers, issued by the Sixth Committee of the United Nations General Assembly, defined groundwater in Article 2, classifying it into internal aquifers and international aquifers.

Aquifers are permeable geological formations containing freshwater, underlain by a less permeable layer and the water contained in the saturated zone of these formations. Groundwater is considered internal and non-transboundary when it is entirely within the territory of a single state.

Thus, an internal aquifer consists of two components: subsurface geological formations that act as reservoirs for water, and secondly, the water stored within them that can be extracted. The term "rock" here is a technical term used by biologists and includes not only solid rock but also gravel and sand. (Mansour Al-Adly 1996)

In order for geological formations to contain water, they must be permeable and have at least a less permeable layer below them and a similar layer above them. In most cases, the saturated zone in the middle of the formation collects water that can be extracted. The water above this saturated zone of the formation is in the form of vapor and cannot be extracted. (United Nations General Assembly, Report, No. A/C.N.4/551, p. 14)

An aquifer network is a series of two or more layers of groundwater that are hydraulically connected. A transboundary aquifer is a series of aquifers that run beneath the territory of two or more countries. Groundwater has several distinct characteristics. Compared to surface water, it can move for a distance of no more than a few thousandths of a centimeter, although it can reach several thousand meters in fractured geological formations. (Muhammad Al-Hussein Sayed Hussein 2022 )

### **Second: The Legal Status of Groundwater from an International Law Perspective:**

As a result of concerted international efforts to explore this important water resource, particularly for landlocked inland countries and others experiencing a scarcity of surface water, jurisprudential initiatives have emerged to define the legal status of groundwater. Several theories have emerged:

#### **1- The Theory of Absolute Territorial Sovereignty.**

This theory allows a state to exercise absolute sovereignty over its groundwater, considering that what lies beneath the dry land of its territory belongs exclusively to it. This principle is considered one of the oldest principles of customary international law. Accordingly, a state alone has the right to utilize its groundwater, without any other state interfering with this right. (Sylvie PAQUEROT )

However, what is taken from this trend is that it can be applied only to internal groundwater, while as for the international groundwater chain that passes through the territory of more than one country, the application of this theory could result in international disputes. ( Julio Barberis 1991)

#### **The theory of absolute territorial integrity:**

This theory emerged as a result of criticisms of the previous theory. According to the former theory, a state can exercise its rights over its groundwater in a manner that infringes on the rights of other states. This theory stipulates that a state exercises its right to utilize its groundwater in a manner that does not infringe on the rights of neighboring states, as a state's rights expire as soon as this right violates the rights of other states. It concludes that this theory is derived from domestic law from the theory of non-abuse of rights, whereby a state exercises its right to utilize a watercourse without infringing on the rights of neighboring states. (Adel Al-Adhayleh 2005)

However, this theory also implies that the state cannot take any action regarding the course of its waterway, even if it does not affect the rights of neighbouring states. Thus, it cannot improve this course or make any modifications to it. (Hamed Sultan 1985)

#### **3- The Theory of Limited Sovereignty:**

As a result of the criticisms received by previous theories, the theory of limited sovereignty emerged. According to this theory, a state may utilize groundwater within its territory and exercise certain powers over it, such as improving it, facilitating access to it, and utilizing it without harming it. This theory has gained international acceptance in international jurisprudence and judiciary, as it is based on several established international principles established in international custom and law, including the principle of good neighborliness and non-harm. ( Adel Al-Adhaileh, the previous reference, p. 396)

We find several international applications of this principle, especially by international courts, including the ruling of the Permanent Court of International Justice issued on September 10, 1929, regarding the territorial jurisdiction of the Oder River Commission. The court concluded that states have a joint sovereign right over the water resources found in the river, and the basis of this sovereignty is the common interests of all parties involved in this water resource. ( Mustafa Sayed Abdel Rahman 1991)

Although most international legal rulings have concerned surface water and international rivers, jurisprudence has considered the applicability of these theories to groundwater, as it is one of the most important water resources on the Earth's surface.

#### **Second Topic: The International Legal Regime for Groundwater:**

Groundwater is considered one of the most important sources of freshwater on the Earth's surface, but international attention to it has not been as optimal as that enjoyed by surface water and other waterways. As a result of the drought experienced in some regions of the world, coupled with the increase in population, countries have intensified their efforts to pay greater attention to this water resource by establishing a set of legal principles upon which the exploitation of this important resource is based.

#### **First: The Dublin Principles Governing Groundwater Utilization:**

In 1992, the Dublin Conference established four guiding principles for the management of freshwater resources. These principles emphasize the following: (1) the importance and value of water as an essential resource for sustaining life, achieving development, and preserving the environment; (2) the need for a participatory approach to water resource development and management, with water users, planners, and policymakers being part of this process; (3) the important role of women in conserving, protecting, and managing water resources; and (4) recognizing water as an economic commodity given its economic value in various uses. (See the

United Nations website: <https://archive.unescwa.org/ar/dublin-principles>, last accessed on 02-01-2025.)

**Principle 1:** Freshwater is a limited and fragile resource, essential for sustaining life, development, and the environment. Since water sustains life, effective water resource management requires a holistic approach that links social and economic development with the protection of natural ecosystems. Effective management links land and water uses across the entire catchment area or aquifer.

**Principle 2:** Water development and management should be based on a participatory approach that includes users, planners, and policymakers at all levels. A participatory approach involves raising awareness of the importance of water among policymakers and the general public. This means that decisions are made at the lowest appropriate level, with full public consultation and user involvement in the planning and implementation of water projects.

**Principle 3:** Women play a key role in water provision, management, and conservation. This pivotal role of women as providers, users, and custodians of the living environment is rarely reflected in institutional arrangements for water resource development and management. Accepting and implementing this principle requires affirmative policies to address the special needs of women and to equip and empower them to participate at all levels in water resources programs, including decision-making and implementation, in ways they identify.

**Principle 4:** Water has economic value in all its competing uses and should be recognized as an economic good. Under this principle, it is critical to first recognize the fundamental right of all people to access clean water and sanitation at affordable prices. Past failure to recognize the economic value of water has led to wasteful resource use and environmental damage. Managing water as an economic good is an important means of achieving efficient and equitable use and encouraging the conservation and protection of water resources.

## **Second: General principles established in international public law:**

The optimal exploitation of groundwater resources requires respect for international obligations, which entail cooperation in protecting these shared water resources among all neighboring countries, particularly those related to freshwater. This is achieved by establishing a set of mutual measures and obligations among neighboring countries, which are agreed upon through international agreements and treaties and may also be stipulated in recommendations issued by international organizations. (Mohammed Salam Mohammed 2005)

Groundwater resources have received common attention from the international community, as evidenced by most of the international legal agreements drafted to protect this important resource, including the 1997 Convention on the Non-Navigational Uses of Watercourses and the 2008 United Nations General Assembly Bill of Rights on the Law of the Use of Aquifers.

### **1- The principle of equitable and reasonable use of groundwater:**

This principle has been enshrined in international custom for centuries and has been adopted in numerous international case law. It states that groundwater resources are among the most important sources of natural freshwater. Therefore, states have the right to use them equally and fairly, without granting any one source preferentially over another. It has been adopted by numerous international agreements and treaties, (Sobhi Ahmed Zuhair 2007) as well as numerous international resolutions, the most important of which are:

-The United Nations Recommendation on the Use of Non-Maritime International Waters for Navigational Purposes: Article 4 of which stipulates that in the event of an international dispute arising regarding the use of certain waters, the principle of equitable use must be taken into account in its settlement, taking into account the circumstances and basic needs of each country without any restriction that is harmful to its basic interests. In the event that this is done, it must

be done in accordance with fair and equitable compensation provided to the affected party.( Dalia Ismail Mohamed2006)

- The Stockholm Declaration of 1972, which recommended that the use of freshwater in areas shared by states should be based on equitable use and distribution. (DECLARATION OF THE UNITED NATIONS CONFERENCE ON THE HUMANENVIRONMENT 1992)

- Recommendation No. 91 of the 1977 United Nations Water Conference in Argentina, which states that the use of shared waters between countries must be carried out in accordance with equitable distribution between countries, in order to strengthen international relations and achieve the principle of international cooperation.

Article 5 of the Helsinki Principles includes a set of criteria that must be taken into account when using freshwater resources, including:

- a. Geographical, hydrological, ecological, and other factors of a natural nature.
- b. Taking into account the economic and social needs of each basin state and the populations dependent on the waters of the basin in each state, and the comparative costs of alternative means of meeting each basin state's economic and social needs.
- c. The populations dependent on the watercourse in each basin state.
- d. Avoiding groundwater pollution, particularly through unnecessary waste disposal, when using basin water. Scientific compensation for one or more participating basin states as a means of controlling conflicts between uses, and the comparative costs of alternative means of meeting each basin state's economic and social needs.
- e. The populations dependent on the watercourse.
- f. Existing and potential uses of the watercourse.
- g. Conserving, protecting, developing, and using the water resources of the watercourse, and taking the necessary measures to do so.
- h. Attempting to provide alternatives to the watercourse.( See Article VI of the Convention on the Law of the Non-Navigational Uses of International Watercourses, op. cit., corresponding to Article V of the Helsinki Rules.)

Many international court rulings have relied on this principle to resolve disputes brought before them regarding the construction of dams and the use of international river water by basin states. For example, the 1997 ruling of the International Court of Justice in the dispute known as the Gabčíkovo-Nagymaros Project between Hungary and Slovakia stated that watercourse states must participate in the use, development, and protection of an international watercourse in an equitable and reasonable manner. The court also affirmed that Hungary has a fundamental right to participate in the resources of an international watercourse in an equitable and reasonable manner.( Khaled Maarouf 2021)

## 2- The principle of non-harm to groundwater:

This principle is considered one of the established principles of customary international law, under which a state is obligated to take all appropriate measures to avoid harming the rights of other states sharing the same international groundwater. Harm here includes all harm that may affect human safety and health, prevent the use of groundwater for beneficial purposes, and harm the ecosystem of these waters. This principle does not impose an absolute obligation not to cause harm, but it requires states to take the necessary care and appropriate measures to prevent harm.( United Nations Economic Commission for Europe, Practical Guide to the Establishment of Agreements or Other Arrangements for Transboundary Water Cooperation, Geneva, 2021, p. 21.)

This has been emphasized in numerous international agreements. Article 3 of the Charter of Economic Rights and Duties of States is included in the Charter. Article 3 of the 1992 Water Convention also includes guidelines on the types of measures that can be adopted to prevent harm, which are assessed by each state according to its own circumstances.

Regarding the duty of care, the International Court of Justice, in the case between Argentina and Uruguay concerning the Uruguay River Pulp Mills, recognized that the duty of care entails not only

the adoption of appropriate rules and measures, but also a certain level of vigilance in their implementation and the exercise of administrative oversight by public and private sector managers in the state and workers extracting groundwater, through monitoring and controlling their activities in the groundwater basin. Accordingly, and in order to avoid harming groundwater, states take the necessary measures to prevent transboundary effects. According to the 1997 United Nations Watercourses Convention, states are obligated to take certain necessary measures to prevent harm to other states. Based on this, some states have adopted bilateral and multilateral agreements to coordinate their use of various freshwater resources, including groundwater. Among these agreements is the 2009 Agreement between Sweden and Finland on Transboundary Rivers, which includes transboundary effects. (United Nations Economic Commission for Europe, Practical Guide to the Establishment of Agreements or Other Arrangements for Cooperation in the Field of Transboundary Waters, op. cit., p. 21.)

In this regard, we find that Article 7 of the Convention on the Law of the Non-Navigational Uses of International Watercourses obliges States, once they have begun to utilize an international water resource within their territories, to take all necessary measures to prevent causing significant harm to neighboring States. Accordingly, whenever harm occurs to other States that benefit from the same water resource, the States that caused the harm through their use of it, in the absence of an agreement between them, shall take all appropriate measures, taking into account the duty to consult with the affected State in order to mitigate or eliminate this harm and to discuss, in an appropriate manner, the issue of compensation to be provided to the affected State or States.

### **3- Prior notification and non-abuse of rights:**

One of the most important obligations arising from the principle of cooperation between riparian states is the principle of prior notification. This means that the groundwater state whose water resources are being explored must notify the state in a manner that could affect its water share.

One contemporary legal application of the prior notification principle is the Turkish government's violation of this important international legal principle when it constructed the giant Ilisu Dam on the Tigris River. The Turkish government failed to consult with local communities in Iraq and notify them in advance of the construction of the dam, which would be directly affected by the dam's construction, in violation of customary international law. In addition, other legal observations can be made regarding the Turkish government regarding the dam, including its failure to assess the environmental impact of the Ilisu Dam and to determine the transboundary impacts on the people and environment in Iraq, a flagrant violation of customary international law. Furthermore, the decision to approve the Ilisu Dam, as proposed, is likely to cause negative harm to neighboring states, in contravention of Türkiye's duty to prevent harm. Transboundary damages: In addition, the Turkish government has violated its commitments to treaties with Iraq relating to good neighborliness and the shared use of international water resources. (Khaled Maarouf, the previous reference, p. 755.)

### **4- The principle of international cooperation:**

The principle of international cooperation essentially stems from the United Nations Charter through Article 1, paragraph 3. (It states that: "The purposes of the United Nations... are to achieve international cooperation in solving international problems of an economic, social, cultural or humanitarian character, and in promoting and encouraging respect for human rights and for fundamental freedoms for all without distinction as to race, sex, language or religion.")

The 1970 Declaration on Principles of International Law concerning Friendly Relations and Cooperation among States in accordance with the Charter of the United Nations also includes a reference to the necessity of cooperation among states. This principle not only ensures the equitable use of transboundary groundwater, but also contributes to ensuring that a state is not subject to abuse of its rights and prior notification of its exploitation and use of this resource. This



contributes to the implementation of the procedural rules known in international law, which include notification of future measures and plans undertaken by states. This is subject to international diplomatic relations and bilateral and multilateral agreements concluded by states in this regard.

Article 8 of the 1997 Watercourses Convention stipulates that states shall cooperate on the basis of sovereign equality and territorial integrity, for mutual benefit and in good faith, to achieve optimal utilization of this international watercourse and to ensure adequate protection thereof. It is worth noting here that the 2008 United Nations Draft Law on Transboundary Aquifers addresses the principle of international cooperation to protect these aquifers in Article 7. Article 8 also includes the necessity of exchanging information between states regarding the same resource.

### CONCLUSION:

As a result of the limited water resources in the world and the water scarcity facing many countries, which is primarily related to complex natural factors, countries have begun to seek additional resources to address the water scarcity they are experiencing. In doing so, they have relied on groundwater resources, which represent the largest international reserve of freshwater resources in the world.

As a result of the importance of this water resource and the potential for numerous international conflicts and disputes over it, international interest has emerged and a global race has begun to compile and consolidate reliable legal rules and principles to regulate the equitable use of groundwater resources.

Among these international initiatives to formulate and establish these principles are the Helsinki Rules of 1966, which continued until the draft law on transboundary aquifers of 2008.

Adopting international principles for the protection of groundwater resources would establish the equitable use of this water resource, ensuring its shared and balanced distribution among all neighboring countries. This would ensure cooperation and growth in all fields, particularly economic and social.


It remains the responsibility of countries sharing international groundwater to cooperate with each other on the basis of respecting the rights of other countries and not abusing rights, while ensuring their protection from pollution in a manner that ensures their continuity and development.

In light of this, we have decided to put forward the following recommendations:

- Countries should intensify legal, scientific, and practical studies and research to examine all aspects related to the protection of international groundwater aquifers.
- The need to develop bilateral and collective agreements between all countries sharing transboundary groundwater.
- The need to provide a database that gathers all information about groundwater resources across national borders and internal ones, through which countries can know the number and size of wells in each region.

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