
| RESEARCH ARTICLE

Transboundary Water Governance: Legal Challenges in Regulating International Rivers and Seas in the Context of Climate Change and Geopolitical Conflicts

Sawsan Hussein Abed

Babylon Technical Institute, al-Furat al-Awsat Technical University

Corresponding Author: Sawsan Hussein Abed, **E-mail:** sawsan.abed.iba@atu.edu.iq

| ABSTRACT

This research focused on transboundary water governance as a legal and governance framework for the use of international rivers and seas. It showed that it is founded on important legal principles, in particular equitable and reasonable use and the prohibition of significant harm. It also demonstrated that climate change has led to water scarcity and variability, making it more difficult to manage for states. The study also focused on geopolitical disputes making water a very sensitive issue in international politics. It explained the function of international treaties in managing the use of shared water resources, which are often ineffective. It also noted the role of international cooperation and water diplomacy in preventing conflicts and ensuring sustainability. It also found that there is a need to create legal mechanisms to address modern environmental and geopolitical issues.

| KEYWORDS

Transboundary water governance, International water law, Climate change, Geopolitical conflicts, Water sustainability

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Introduction

International waters, or transboundary waters, are areas of the oceans that lie beyond the jurisdiction of any state. They generally begin beyond 200 nautical miles from the coasts of states bordering the oceans. As for ocean areas over which states exercise authority, they are called territorial waters. In international law, the high seas are considered open to any state for fishing, navigation, and research. All states have equal rights in the high seas, and each must respect the rights of other states. All states must comply with the international rules governing the high seas. Under international law, the high seas are considered open to any state for fishing, navigation, and research. All states have equal rights in the high seas, and each must respect the rights of other states. International law allows neutral states during wartime to continue trading with other neutral states and with belligerent states. However, at such times, vessels of neutral states are not expected to transport prohibited wartime trade (contraband). The belligerent states determine the materials they consider wartime contraband. There has long been dispute among states concerning the law of the sea. Between 1982 and 1986, the United Nations produced laws of the sea intended to satisfy all states. This effort led to the adoption of the 1982 United Nations Convention on the Law of the Sea. More than one-hundred-member states of the United Nations signed the Convention. It becomes legally binding only once sixty states ratify it. Generally, the Convention grants states exclusive rights to explore for oil and gas up to a distance of 350 nautical miles (648 km) from the shore, and to fish within 200 nautical miles (370 km) of their coasts. Within these 200 nautical miles—known as the Exclusive Economic Zone—all states retain high-seas rights related to navigation and overflight, but coastal states control all economic resources in the area. Most states agree that the right to conduct seabed mining is not part of the freedoms of the seas; however, such a right may arise under the provisions of a treaty. For this reason, the Convention did not enter into force until 1994. Among the states that have not ratified it are the United States of America and Canada, even though most of the Convention's provisions are, in practice, already being observed.

Significance of the Study

This study is important from a number of main aspects, including legal importance, as it draws attention to the deficiencies in the international legal norms regulating shared water resources, and the effectiveness of these norms in conflict resolution. Second: Environmental importance, as it highlights the interrelationship between climate change and the sustainability of water resources and the consequences of this relationship on the environment and human life. Finally, it has political (geopolitical) importance, which focuses on the role of water as a factor in international relations, either as a source of cooperation or conflict.

Study Procedures

This study adopts a set of scientific methods and procedures, primarily the descriptive-analytical method to study the international legal framework governing transboundary waters (such as international conventions and legal principles), and the comparative method to study international experiences in managing transboundary rivers and seas and best practices.

Research Structure

The research deals with the conceptual and legal framework for the governance of transboundary waters by clarifying their concept, features and evolution in international law, where water governance has become an integrated approach that relies on the principles of participation, transparency and equitable utilization. Similarly, the management of international rivers and seas is also based on clear legal rules, particularly the principle of no-harm and the principle of equitable utilization, along with international treaties regulating the management of shared rivers and seas. The research also focuses on challenges of the governance of shared waters, be they environmental challenges in light of climate change and the strains it places on the sustainability of water resources, or geopolitical challenges in the context of international water disputes. By contrast, the mechanisms of international cooperation, mediation and agreements become important means of resolving disputes and improving the governance of shared waters.

Chapter One

The Conceptual and Legal Framework for the Governance of Transboundary Waters

Transboundary water governance is one of the modern topics that has attracted growing importance in the field of international law, due to the vital significance of shared water resources to the riparian states. In light of the increased reliance on these resources for human and development needs, there has emerged a need to develop a conceptual and legal framework that sets the grounds for the equitable and sustainable management of these resources. The link between national interests and environmental concerns has contributed to the complexity of governing the use of international rivers and seas, and therefore required the establishment of legal rules and international principles that govern this area. Recent developments, especially in international environmental law, have also helped to broaden the concept of water governance to include a variety of dimensions that go beyond the allocation of waters to a holistic and sustainable resource management. Thus, this chapter seeks to clarify the basic concepts of the governance of transboundary waters, as well as to provide an overview of the legal framework regulating the use of international rivers and seas so that it may help to explain the theoretical basis of this research.

Section One

The Nature of Transboundary Water Governance

The definition of the concept of transboundary water governance is a crucial step in understanding the nature and challenges of this field, since this concept is linked to principles and mechanisms that regulate the use of shared water resources by the states involved. The issue does not only concern the establishment of legal norms, but also the institutional and administrative arrangements that facilitate coordination and cooperation between the interested parties. The water governance concept has also developed in parallel with the evolution of international legal thinking, shifting from a focus on the sovereignty of states to more balanced principles such as equitable and reasonable use and no-harm. It has also been linked to the issue of sustainability, climate change and water security. In this sense, this section will first discuss the concept of transboundary water governance and its features, and then the evolution of this concept in international law.

First Subsection

Definition of Transboundary Water Governance and Its Characteristics

The term “governance” is derived in Arabic from the trilateral root ḥ-k-m, and the verb ḥakama or aḥkama a thing means preventing it from corruption. This term is well-established in the Arabic language and is used as the equivalent of the English word

"governance" or the French "gouvernance." Governance emerged in the contemporary context of semantic and morphological developments that accompanied the rise of globalization and computerization. Thus, the concept of governance is considered a broad notion that encompasses numerous definitions and specialized connotations¹.

The governance of transboundary waters is a relatively modern concept within the field of international law, emerging as a result of increasing challenges associated with the management of shared water resources among states. With rising demographic and economic pressures, coupled with accelerating environmental changes, it is no longer sufficient to rely on traditional conceptions based on the principle of absolute state sovereignty over its natural resources. Instead, it has become necessary to adopt more comprehensive and integrated approaches based on cooperation and coordination among riparian states.².

Water governance may be defined, according to the Global Partnership, as follows: "Water governance refers to the set of political, social, economic, and administrative systems in place to develop and manage water resources and water services at different levels of society." The World Bank offered a definition of the concept describing it as "the manner in which power is exercised in the management of a country's economic and social resources for development." The United Nations Development Programme (UNDP) similarly defined governance as "the exercise of economic, political, and administrative authority to manage the affairs of individuals and groups to achieve their interests." One of the most widely recognized definitions of water governance is that put forward by Peter Rogers, who defines water governance as: "a set of political, social, economic, and administrative systems suitable for the development and management of water resources and the provision of water services at various societal levels". Water governance relates to how decisions on water are made³.

In this regard, the management of transboundary waters marks an important evolution in the thinking of international law, as it has shifted its emphasis from unilateral sovereign rights to a participatory, collective approach. This is evident in the development of a number of basic principles, such as the principle of equitable and reasonable utilisation, the principle of no significant harm, and the principle of prior notification and consultation, which have emerged to form the core of any effective legal framework for the governance of shared waters.⁴

This notion is also tied to the notion of "governance", which relates to the processes and mechanisms through which public resources are managed in a transparent, accountable and participatory way. As such, the governance of transboundary waters does not just refer to the role of states, but also international and regional organizations, civil society, and in some instances, the private sector, so reflecting the multilateral character of this realm.

The governance of transboundary waters is characterized by several features that distinguish it from other areas of governance. The first of these characteristics is its international nature, as such governance arises within the context of complex international relations in which legal, political, and economic considerations intersect. The management of an international river or a shared sea requires continuous coordination among the states concerned, which may face significant challenges in light of differing national interests and disparities in economic and technical capacities.

The second characteristic lies in its cooperative nature, as the governance of transboundary waters is based on the principle of cooperation as a fundamental condition for achieving effective management. The absence of cooperation among riparian states

¹ Mohammed Hassan Ismail Ahmed Ali, "Water Governance in the European Union: The Legislative Dimension and the Institutional Dimension 2004–2012," Master's Thesis, (Cairo: Faculty of Economics and Political Science, 2015), p. 36.

² Samir Hadi Salman, *International Rules Regulating the Sharing of Water and the Problem of the Distribution of the Waters of the Tigris and Euphrates Basins between Turkey and Iraq*, Al-Aref Foundation for Publications, 2014, p.87

³ Ibrahim Jaber Al-Sayyid Ahmed, *Administrative Governance*, Dar Al-Ilm wal-Iman for Publishing and Distribution, without year of publication p.13

⁴ Alaa Hussein Jassim Al-Samara'i, *The Legal Regulation of the Use of International Watercourses for Non-Navigational Purposes (A Legal Study in the 1997 United Nations Convention)*, 1st ed., Arab Center for Publishing and Distribution, 2023, p.67

may lead to the escalation of disputes and threaten regional water security. Therefore, international agreements often emphasize the necessity of establishing joint mechanisms, such as river commissions, to coordinate policies and exchange information.⁵

Another feature also appears, that is, the comprehensiveness of governance, as it is not only concerned with the legal but also the environmental, economic and social aspects. Water resource management involves a balance between development and environmental protection, which is known as sustainable development. In addition, climate change impacts, such as drought and sea-level rise, have introduced a new element, and require the development of adaptable policies.⁶

Another significant characteristic is also its dynamism, as the norms and practices of transboundary water governance are constantly changing in response to global developments. International law is dynamic and constantly evolving through international conventions, international judicial decisions and state practice. This demonstrates the system's flexibility to respond to challenges, such as climate change and technological developments⁷.

Moreover, transboundary water governance is marked by a mix of law and politics, since legal matters are intertwined with geopolitical interests. Water can be a bargaining tool, especially in water-scarce areas, to attain influence or to pressure other parties. This makes water governance a delicate area that needs to strike a balance between law and national interests⁸.

This governance is also characterized by its multilevel nature, given that it involves different levels of administration, ranging from the international level to the regional level, national level and local level. This requires coordination between the various levels to implement water policy in an integrated manner. Failure to achieve this may result in policy inconsistencies and affect the quality of governance.

The feature of transparency and accountability is also crucial, as it is one of the key aspects of good governance. The sharing of water resources demands the exchange of information between states, especially with regard to water-flow data, dam construction and environmental conditions. The accountability mechanisms play a role in enhancing states' trust and preventing disputes.

The second section

The Evolution of the Concept of Water Governance in International Law

Water governance in international law has passed through a number of historical phases in line with the political, economic and environmental factors that have shaped global relations. This term was not used in the early years of international law; rather, it has developed in the context of the need to regulate the use of shared water resources between states, in the face of increasing reliance on these resources and the challenges they pose⁹.

During the traditional period, which lasted until the early 20th century, the doctrine of transboundary water management was founded on the principle of absolute state sovereignty, in which each state considered itself as having an absolute right to use the water resources flowing through its territory, regardless of the impact on other states. This was reflected in the so-called principle of "absolute territorial sovereignty" that gives the state complete freedom to use its natural resources without any

⁵ Ibrahim Ahmed Abdul-Samara'i, *Guarantees of Iraq's Water Share in International Law*, Lecture Series at the College of Law, Cihan University, Erbil, 2019 'p.98

⁶ Islam Mohammed Abdul-Samad, *International Protection of the Environment from Pollution in Light of International Conventions and the Provisions of International Law*, Dar Al-Jami'a Al-Jadida, 2016 'p.54

⁷ Mohammed Mahmoud Mehran, *Arbitration in Disputes of International Rivers*, Dar Al-Nahda Al-Arabia, Egypt, 2023 'p.146

⁸ Ziad Khalil Al-Hajjar, *Water Security and Food Security: Water in the Middle East and North Africa as Alternatives to Wars and Development*, Dar Al-Nahda, 2009 'p.127

⁹ Sharif Mohammed Ahmed Abdel-Jawad, *The American-Soviet Conflict Regarding Navigation in the Danube River*, Journal of the Faculty of Arts, Fayoum University, Vol. (13), Issue (1), 2021 'p.126

outside interference. But this notion soon faced numerous criticisms for the potential damage it could inflict on other riparian states, particularly in the case of water-related projects like dams and diversion.

With the increase in disputes among states over the use of shared waters, doctrinal and judicial trends began to emerge calling for restricting the principle of absolute sovereignty and replacing it with more balanced principles that take into account the interests of all parties. One of these was the principle of "limited sovereignty" or "equitable and reasonable utilization" that holds that each state has the right to make use of the common water resource as long as it does not cause injury to other states.

These developments paved the way for a different phase in the evolution of water governance, during which customary rules in international law arose to establish a number of basic principles for the use of transboundary water resources. These include the principle of no significant harm, the principle of cooperation and the principle of prior notification, which helped to entrench the idea of shared management of water resources.¹⁰

Since the mid-20th century, water governance has evolved qualitatively as a consequence of the growing international concern for environmental issues, especially after the recognition of the need to conserve natural resources. This was reflected in the introduction of the environmental dimension into the rules of international water law, in which the emphasis was no longer solely on resource allocation but also on their protection and the guarantee of their sustainable use.

Water treaties also became the main instrument for the regulation of transboundary waters as states tried to enter into bilateral and multilateral agreements to determine their rights and obligations. These agreements helped to develop the notion of water governance by providing rules regarding cooperation and establishing joint water-resource institutions, such as river commissions.¹¹

This period also witnessed the emergence of the role of international organizations in strengthening water governance by providing technical and legal support to states and encouraging them to adopt sustainable water policies. This role contributed to shifting water governance from the realm of bilateral relations to a broader and more multilateral framework.¹²

In the late twentieth century and the early twenty-first century, the concept of water governance entered a new stage characterized by the integration of legal, environmental, and developmental dimensions. This concept became closely linked to the notion of sustainable development, which is based on achieving a balance between meeting present needs and safeguarding the rights of future generations.

This development was embodied in the adoption of a set of modern principles, such as Integrated Water Resources Management, which calls for addressing water as part of an integrated ecological system rather than as an isolated resource. Emphasis was also placed on the importance of involving various actors, including local communities, in the decision-making process, reflecting the participatory nature of governance¹³.

On the contrary, the role of international judiciary has been significant in the evolution of water governance, as the decisions rendered in water-related disputes have helped to interpret and understand the pertinent legal provisions. These have emphasised principles like equity and justice, and the duty of cooperation and good faith among states.

In recent years, given current issues, especially climate change, the notion of water governance has also evolved as it has been necessary to implement flexible and adaptable measures to cope with environmental changes. Climate change has a direct impact on the allocation of water resources, as it leads to changes in rainfall patterns and more frequent droughts and floods, making transboundary water management more complex.

The worsening of geopolitical tensions in some areas has also made water a critical factor in international relations, requiring the consolidation of governance arrangements to secure the peaceful and fair use of water resources. In this regard, water diplomacy has become a key aspect to resolve disputes and strengthen cooperation.

¹⁰ Ziad Khalil Al-Hajjar, previously cited source ‘p.132

¹¹ Mohammed Mahmoud Mehran ,previously cited source ‘ p.147

¹² Ziad Khalil Al-Hajjar, previously cited source ‘p.136

¹³ Sharif Mohammed Ahmed Abdel-Jawad ,previously cited source ‘p.126

The second topic

The legal foundations for the regulation of international rivers and seas

International water resources, whether transboundary rivers or shared seas, are among the areas that most require precise legal regulation due to the multiplicity of parties involved in their exploitation and the interwoven nature of the interests connected to them. The absence of a clear and organized legal framework may lead to the emergence of disputes between states, especially in light of the increasing demand for water and the worsening environmental and climatic challenges. International law, throughout its historical development, has sought to establish a set of rules and principles governing the use of these resources in a manner that achieves a balance between the right of states to benefit from them and their obligation not to cause harm to others.¹⁴ This regulation is no longer limited to international customs but has come to rely on an integrated system of international agreements and legal principles that form the general framework for the governance of shared waters. In light of these considerations, the importance of studying the legal foundations on which the regulation of these resources is based becomes evident, through analyzing the international legal principles governing shared waters and reviewing the most prominent agreements that have regulated the use of international rivers and seas, with the aim of determining the adequacy of these rules in addressing contemporary challenges, particularly in the context of climate change and the escalation of geopolitical conflicts.

The first branch

The international legal principles governing shared waters

The regulation of international waters in international law is grounded on a series of legal principles that have evolved either through international practice, international treaties or through the jurisprudence of international courts. These principles are the rules that govern the behaviour of states in their interactions with shared water resources, as they seek to strike a balance among conflicting national interests and secure the equitable and sustainable use of these precious resources.

The principle of equitable and reasonable utilization is regarded as a foundational principle in the governance of transboundary waters since it recognises the right of each riparian state to equitably and reasonably use the international watercourse, based on a series of objective criteria, including economic and social needs, the number of people dependent on the resource, the geographical size of the basin, and the existence of other sources of water. This principle does not mean equal sharing of water resources; it is based on a relative equity that takes account of the particular circumstances of each state. This principle has helped to resolve disputes, by offering a flexible standard that can be applied in different circumstances.¹⁵

Linked to this principle is the principle of the obligation not to cause significant harm, which imposes on states a duty not to use shared water resources in a manner that would cause serious damage to other states. This principle embodies the notion of good neighborliness in international law, as it balances the right of a state to exploit its natural resources with its duty to respect the rights of others. However, the application of this principle raises practical challenges, particularly with regard to determining the criterion of "significant harm," and whether every form of harm is prohibited or only harm that exceeds a certain threshold of gravity.¹⁶

Another important principle is the principle of international cooperation, which is regarded as a key element for effective transboundary water management. The characteristics of the resource require riparian states to cooperate in the form of information sharing, policy harmonisation and institutional arrangements for resource management. This cooperation can be in the form of bilateral agreements, joint commissions, or regional and global initiatives. This principle helps to foster trust between states and prevent conflict.

The principle of prior notification and consultation also appears as one of the procedural principles, as it requires a state planning to carry out a project that could have an impact on a shared water resource to inform the other states in advance and to provide them with the relevant information to evaluate the project. This principle seeks to facilitate the states' ability to safeguard their interests and to provide a space for negotiation and the reaching of agreed solutions before the implementation of any project that may have an impact across borders.

¹⁴ Ziad Khalil Al-Hajjar, previously cited source ·p.137

¹⁵ Mohammed Mahmoud Mehran ,previously cited source ·p.149

¹⁶ Ziad Khalil Al-Hajjar, previously cited source ·p.138

Furthermore, there is the principle of good faith which is one of the general principles of international law and which requires states to perform their international obligations in a good faith manner, free from any evasion and harmful practices. This principle is especially important in relation to water, where the success of water governance depends on the willingness to follow the spirit of cooperation rather than the letter of the agreements.

Another principle that has become more important in recent years is the principle of sustainable use, which is an outcome of the impact of international environmental law on water. This principle entails the use of water resources in a way that does not jeopardise the ability of future generations to use their resources. This requires consideration of the balance between economic development and ecosystem protection, which is a significant challenge in the context of climate change.¹⁷

Notwithstanding the significance of these principles, their implementation is fraught with difficulties, the most notable of which include the vagueness of some of the concepts, the different interpretations by states and the lack of effective enforcement mechanisms to ensure compliance. Further, varying economic and technological capacities of states may also impact their adherence to these principles.

The second branch

International agreements regulating waterways and seas

International agreements represent one of the most important formal sources of international law in the field of regulating transboundary waters, as they have significantly contributed to codifying general principles and transforming them into binding legal rules that define the rights and obligations of states. These agreements emerged in response to the increasing need for clear legal frameworks governing the use of shared water resources, amid the growing disputes and the complexity of the related challenges, whether environmental, political, or economic.¹⁸

With regard to international watercourses, a set of agreements has emerged seeking to regulate the use of transboundary rivers and define the foundations of cooperation among riparian states. Among the most important of these agreements are those that established the principle of equitable and reasonable utilization, confirmed the necessity of not causing significant harm, and emphasized the obligation of cooperation and information exchange. These agreements have contributed to establishing an integrated legal framework aiming to achieve a balance between the sovereignty of states and the necessity of jointly managing shared resources.

The agreements related to watercourses have also been distinguished by their adoption of an institutional approach, as many of them stipulated the establishment of joint committees or bodies responsible for managing water resources, coordinating policies, and monitoring the implementation of the agreements. These institutional mechanisms constitute an essential element in enhancing the effectiveness of water governance, as they provide a platform for continuous dialogue among states and contribute to the peaceful settlement of disputes.¹⁹

Conversely, international agreements have not only been concluded for rivers, but also for seas and oceans, which are governed by a more elaborate set of rules. This is due to the unique nature of the seas, whose significance is not limited to coastal states, but also extends to the international community as a whole, in view of the resources they offer and their importance for navigation and international trade.

International agreements on the law of the sea have developed as an integrated legal regime that governs different aspects of the use of the seas, such as the demarcation of maritime zones, the rights of coastal states, freedom of navigation, the exploitation of marine resources and the protection of the marine environment. These agreements have played a crucial role in ensuring legal certainty in this area by laying down precise and comprehensive rules for inter-state relations.

International water agreements are multi-tiered, with global, regional and bilateral agreements. Multilateral agreements set general rules that apply to all states and bilateral agreements address the particularities of the region, such as a river basin.

¹⁷ Ziad Khalil Al-Hajjar, previously cited source ‘p.141

¹⁸ Mohammed Mahmoud Mehran, previously cited source ‘p.152

¹⁹ Daa Mohsen Taher Al-Abadi, Problems of Rivers Shared with Iraq in Neighboring Countries – A Study in International Law, Master’s Thesis, University of Baghdad, College of Law, 2022 ‘ p.121

Bilateral agreements, on the other hand, are the most prevalent, as they are agreements between two states to govern the use of a common water resource, and often contain specific provisions reflecting the nature of the relationship between the parties²⁰.

Another remarkable development has occurred in the content of international agreements as they no longer concern only the regulation of water distribution, but cover a range of other issues, such as environmental protection, risk assessment and climate change adaptation. This trend is indicative of a shift in the notion of water management from resource allocation to integrated and sustainable water management.

One of the most visible aspects of this evolution is the inclusion of the environmental dimension in international agreements, where environmental protection of aquatic ecosystems has become part of any legal framework. There has been a focus on the importance of maintaining water quality, avoiding pollution and protecting biodiversity, which is a clear reflection of the impact of global environmental law on water governance.

In addition, contemporary agreements have also given special attention to the management of disputes, as they have established a series of measures that can be adopted by states in case of disputes, such as negotiation, mediation, arbitration or international judiciary. Such mechanisms help to increase stability and avoid the escalation of disputes, particularly in areas of political conflict.²¹

Although these agreements are of great importance, they face several obstacles that hinder their effectiveness. Foremost among these is the exclusion of some states from some agreements, which limits their coverage. Some of the agreements also do not have robust enforcement measures to ensure compliance with obligations, which could result in non-compliance by some states.²²

Moreover, climate change presents new challenges to agreements, as many of them did not incorporate the potential consequences of climate change (when they were negotiated). This requires revising and amending these agreements to adapt them to the new circumstances, particularly in relation to risk assessment and adaptation to environmental change.²³

On the other hand, disparities in the economic and technical capacities of states may affect their ability to fulfill their obligations, which calls for strengthening international cooperation and providing support to developing countries. Moreover, the overlap between legal and political considerations may hinder the application of some agreements, particularly in regions experiencing geopolitical conflicts.

The second section

Contemporary Challenges to the Governance of Transboundary Waters

In light of the rapidly accelerating global transformations, the governance of transboundary waters is no longer limited to a mere legal regulation of resource sharing, but has come to face a set of complex and overlapping challenges that reflect the nature of the contemporary international system. Environmental changes—foremost among them climate change—alongside the escalating geopolitical tensions among states, have contributed to reshaping the features of managing shared water resources and have rendered the issue of governance more sensitive and complex. These challenges have produced a new reality characterized by increased pressure on water resources, both in terms of quantity and quality, leading to the exacerbation of risks associated with water scarcity and the heightened likelihood of disputes among riparian states. In this context, there is a need to address the current challenges in the governance of transboundary water by looking at environmental and climatic, as well as geopolitical, aspects, and to evaluate the effectiveness of the existing international legal framework in addressing these challenges and to suggest improvements to increase its effectiveness.

²⁰ Diaa Mohsen Taher Al-Abadi, previously cited source, p.128

²¹ Ziad Khalil Al-Hajjar, previously cited source, p.142

²² Abdul-Ridha Kati' Hassoun, *Navigational Uses of the Euphrates River in Light of the Provisions of International Law*, Master's Thesis, University of Kufa, College of Law, 2011, p.48

²³ Diaa Mohsen Taher Al-Abadi, previously cited source, p.131

The first requirement

Environmental and Climatic Challenges

One of the most visible challenges that affect the management of transboundary waters is environmental and climatic, as climate changes have resulted in serious changes in the water cycle, which in turn has affected the availability and sustainability of water resources. Droughts, variations in rainfall and temperature rises have begun to occur in many areas, which directly impact river flows and sea water level. These are not only related to quantitative but also to qualitative aspects, including water quality and the associated ecosystems, which will make water governance more complex. In addition, climate change impacts are not distributed equally among countries. Hence the need to understand the effects of climate change on global water resources and the sustainability challenge under increasing environmental pressures, which will be the subject of this assignment.

The first branch

The Importance of Analyzing the Impact of Climate Change on International Water Resources

Climate change is no longer just a limited environmental phenomenon; it is a structural phenomenon that is altering water distribution patterns, affecting state stability and the nature of international relations relating to the management of shared resources. In this sense, the relevance of this analysis lies in the understanding of the global reality of water and in the interpretation of legal and political challenges posed by it.²⁴

The main importance of the present analysis is that it contributes to our knowledge of the recent water cycle changes affecting international waters. Climate change has clearly caused a disturbance in the water cycle through precipitation, temperature and evaporation changes, which has been observed in the flows of international rivers, the levels of shared lakes and groundwater. Analysing these changes allows scientists and policy-makers to assess the nature of water resource changes and to assess the level of stability or sensitivity to depletion, which provides a critical basis for future water planning.²⁵

The relevance of this analysis is also seen in the fact that it will assist in the determination of risks involved in the international water security. Transboundary waters constitute a crucial source to a great deal of states and any alteration in the amount or quality could cause a direct hazard to water, food and energy security in the states. As the impact of climate change increases, there are river basins that have started experiencing a progressive water shortage whereas others are experiencing frequent floods, which makes resource distribution unstable. By studying these impacts, the most water-prone states could be determined and adaptation and mitigation strategies against the possible risks could be developed.²⁶

On the other hand, this analysis acquires great legal significance, as it contributes to developing a deeper understanding of the adequacy of the rules of international water law in confronting climate change. The traditional international law of water, which is based on principles such as equitable and reasonable utilization and the obligation not to cause harm, was not originally designed to address rapid and unstable climatic changes. Therefore, studying the impact of climate change helps to highlight the shortcomings of these rules and opens the door to their development or reinterpretation in a manner consistent with the new environmental reality. This study also supports the jurisprudential debate regarding the incorporation of the principle of environmental sustainability and the precautionary principle within the rules of international water law in a clearer and more binding manner.²⁷

The importance of this analysis also emerges in its contribution to strengthening international cooperation in the management of shared water resources. Understanding the impact of climate change on international rivers and seas drives states to recognize that the challenges they face are not isolated but shared, and therefore require a collective response. The reduction in river flows, pollution of rivers or increase in sea levels cannot be solved by national actions but by effective coordination on a regional and international level. Therefore, scientific study of these effects forms a basis of improving water diplomacy and developing trust in the riparian states. Moreover, the analysis helps to strengthen the notion of environmental sustainability since it reveals the need

²⁴ Sharif Mohammed Ahmed Abdel-Jawad, previously cited source ‘p.128

²⁵ Ayed Hamza Jabr Al-Saidi, Settlement of Disputes Arising from the Use of International Watercourses, Master’s Thesis, University of Karbala, College of Law, 2022 ‘p.76

²⁶ Abdul-Ridha Kati’ Hassoun ,previously cited source ‘ p.48

²⁷ Sharif Mohammed Ahmed Abdel-Jawad, previously cited source ‘p.131

to maintain water resources to be used by the future generations with a growing climate impact. Climate change is not merely a present problem but a future problem, and it is important to take a long-term approach to water management, which is based on rationalization, protection and adaptation to the environmental changes.

The Second Subsection

The Problematic of Water Sustainability under Environmental Pressures

Water sustainability is among the most pressing topics in the sphere of transboundary water management, because it is directly associated with the capacity of states and the global community to make sure that water resources are available to the current and future generations, in the context of growing environmental stress and rapid climate change. The problem is especially obvious in the situations when the national interests of the riparian states come into conflict with the needs of conserving the aquatic environment, and the realization of the harmony between exploitation and protection becomes exceptionally complicated.

Water sustainability refers to an approach that aims to manage water resources in a manner that guarantees their continued availability in sufficient quantities and acceptable qualities, while preserving the ecosystems associated with them and without impairing their natural regenerative capacity. However, this concept faces increasing challenges in the international context due to the continuous rise in water demand, the degradation of water resources, the exacerbation of climate change effects, and the unregulated urban, industrial, and agricultural expansion in many regions.²⁸

Among the most prominent dimensions of this issue is the growing pressure on freshwater resources, as the world is witnessing rapid population growth accompanied by a significant rise in water consumption rates across various sectors. The agricultural sector is the largest consumer of water, followed by the industrial sector and then domestic uses. This increase in demand leads to the depletion of rivers, lakes, and groundwater at levels exceeding their natural capacity for renewal, threatening their long-term sustainability, especially in regions already suffering from water scarcity.²⁹

Water quality degradation is also one of the core factors of the sustainability dilemma. The quality of surface and ground water is degraded due to pollution caused by uncontrolled industrial production, dumping of untreated wastewater and over exploitation of pesticides and fertilizers in agricultural work. This degradation has a direct impact on the health of the people and aquatic life and diminishes the possibility of future use of the same resources even when it is available in terms of numbers.

The problem of sustainability becomes even more complicated by climate change that causes changes in the rain distribution, temperature and evaporation rates which adversely influence the water cycle balance in nature. Additionally, such extreme climatic phenomena as floods and droughts are increasingly more frequent and severe, which affects the stability of the water resources and makes them more complex and harder to manage.

Conversely, the groundwater is one of the resources facing the greatest danger of unsustainability, considering that it has been one of the main supply of water, particularly in arid and semi-arid areas by many states. But due to the excessive use of such waters without considering the natural recharge rates, these waters are gradually being depleted and in some cases even become saline, making it very hard or even impossible to restore such waters. This scenario is a major threat to water security in the future.³⁰

The problem of water sustainability is also closely linked to the issue of non-integrated management of water resources, as many states suffer from a lack of coordination among the various sectors concerned with water, such as agriculture, energy, and the environment. This fragmentation in management results in conflicting policies and irrational exploitation of resources, which exacerbates the sustainability crisis. For this reason, the concept of Integrated Water Resources Management has emerged as

²⁸ Ibrahim Faisal Matar, *Iraqi Foreign Policy toward the Water Crisis with Turkey after 2003 (A Study on the Effectiveness of Parliamentary Committees)*, Doctoral Dissertation, Islamic University of Lebanon, Faculty of Political, Administrative and Diplomatic Sciences, Department of International Relations and Diplomacy, 2022, p.72

²⁹ Abdul-Ridha Kati' Hassoun, previously cited source, p.49

³⁰ Sharif Mohammed Ahmed Abdel-Jawad, previously cited source, p.132

one of the modern solutions aimed at achieving balance among various uses while taking the environmental dimension into account.³¹

From a legal perspective, water sustainability faces challenges related to deficiencies in the international legal framework in certain aspects, as many international agreements still focus more on regulating water allocation among states than on protecting the aquatic ecosystem as a whole. The weakness of enforcement and monitoring mechanisms also makes it difficult to ensure states' compliance with sustainability principles, especially when national interests conflict.

There has also been the need to incorporate the principle of environmental sustainability in the very fabric of water policies, in such a way that the goal is not merely to satisfy the present needs but to ensure that ecosystems have the capacity to keep on offering its services. This will necessitate the implementation of consumption-rationalization policies, promotion of modern irrigation technologies, re-use of treated water and preserving water sources against pollution.

The Second Topic

Geopolitical Challenges and Mechanisms of Response

Along with the environmental and climatic problems in the governance of transboundary waters, there also arise a set of geopolitical problems that are no less significant or complicated as water resources have become a major factor in international relations and a possible cause of tension and conflict between the riparian states. Water is no longer just a natural resource that is used to develop something; in most instances, it has become a strategic tool that is associated with national security, sovereignty and regional balances. Against these realities, the matter of geopolitical challenges has become a real test of the effectiveness of the rule of international law in relation to transboundary waters and this calls upon the study of these challenges and the analysis of their different dimensions, and the analysis of the legal and diplomatic means of resolving their disputes and enhancing cooperation among states, in a way that will achieve more stable and equitable management of the shared waters.

The First Subsection

International Water Disputes and Their Political Dimensions

International disputes over water represent one of the most prominent manifestations of tension in relations between states in the modern era, as transboundary water resources have shifted from a factor of cooperation and integration to a potential driver of conflict and political polarization. This is due to the special nature of water as a vital resource indispensable for life and development, and at the same time a limited resource affected by various natural and human-induced changes, making its control or shared use among states a matter of great sensitivity and complexity³².

Such conflicts are especially pronounced in common river basins, where multiple states rely on the water system or river and this leads to overlapping interests and rights. In these instances, the upstream states are usually tempted to take advantage of the water resources according to their developmental requirements, and the downstream states are worried about the adverse effects of the exploitation, be it in quantity or quality of water. This difference in interest creates a fertile background towards the development of political and legal disputes between the riparian states.³³

One of the most prominent expressions of these conflicts is large-scale water projects, including damming rivers, diversion of rivers or the creation of irrigation and hydropower stations. Even though such projects play a significant role in the economic and development of the implementing state, they can lead to significant alterations in the water flow to other states which results in the development of diplomatic tensions and, in some cases, the emergence of serious political crisis. It is further complicated by the fact that in the absence of binding agreements or in case some states do not adhere to the principle of prior notification and consultation, the situation becomes even more complicated.

The problem of water conflicts is not restricted only to rivers but also to transboundary ground water which is one of the hardest resources to legally control because it is not visible and geographically connected. Overexploitation of such waters by a given state

³¹ Abdul-Ridha Kati' Hassoun, previously cited source ' p.65

³² Sharif Mohammed Ahmed Abdel-Jawad, previously cited source 'p.136

³³ Ramadan Ghazal Nu'man, The Right to Obtain Safe Water, Master's Thesis, University of Diyala, College of Law and Political Science, 2020 'p.98

can cause depletion or pollution of these waters thus impacting on other states and increasing the conflict over the right to use such waters and the responsibility of sharing the same.

On the same note, the international maritime zones are also significant in geopolitical tensions especially in respect to the delimitation of maritime boundaries, the exploitation of natural resources on the continental shelf and the rights to navigation within exclusive economic zones. The economic and strategic value of the mentioned resources has seen disputes among states occur in numerous maritime regions over the delimitation of maritime borders or rights to exploit oil, gas and fishery resources.

The water-related conflicts acquire more political overtones when tied to the idea of national security and state sovereignty as some states perceive that the ability to control the shared water resources is a part of their absolute sovereignty and other states perceive that these resources should be managed in accordance with the principles of cooperation and international fairness. Such a difference in views complicates the negotiations process and restricts the usefulness of the classical legal solutions.³⁴

Power imbalance between states is also significant in contributing to water conflicts because some states can use their political, economic, or technical power to exert their influence over the common water resources and the weaker states would be at an unequal bargaining advantage. This scenario brings up concerns concerning fairness in water allocation and makes it more challenging to arrive at balanced and stable agreements.

Conversely, water conflicts tend to overlap with larger regional conflicts, where water is not the source of conflict but is incorporated into a larger system of political, economic and security differences. In that situation, it is hard to distinguish the dimension of water and the other geopolitical dimensions, and resolving the disputes gets more complicated and demands intervention by international or regional forces.³⁵

The development of water conflicts in the contemporary period also has been inter-connected with climate change that has caused more water shortage and altered the availability patterns, thus heightening the conflict between the states. As the water resources of certain areas have dropped and the demand has increased, water has become a more sensitive aspect of international relations and one of the aspects that affect the stability of a region.

The Second Subsection

Mechanisms of Cooperation and Settlement of International Water Disputes

The concept of cooperation in the area of transboundary waters is based on a major principle represented by good-neighborliness and integration of the management of the common resources, in which the riparian states are expected to align themselves with each other in the use of shared water basins. This collaboration can be in various ways and is initiated by sharing information and hydrological data, then consultations in water projects, and finally, joint institutions in the management of river basins or regional seas. The part of information exchange is an essential aspect here as it allows states to evaluate the potential effects of any water project, contribute to transparency, and decrease the risk of misconception or escalation.

One of the most noticeable aspects of international collaboration in this direction is the formation of common commissions and organizations on the management of water basins. They are institutions that are permanent, which consist of representatives of the states of interest, and they strive to organize the policies concerning the water, control the quality and quantity of water, and create joint strategies on the sustainable use. These committees help in earning the trust of the states and offer an institutional space in which there is ongoing dialogue and assist in solving disputes before they can escalate. These mechanisms also form a good instrument towards enhancing regional stability especially in regions that are facing water shortage or growing strain on resources.³⁶

³⁴ Ramadan Ghazal Nu'man, previously cited source 'p.100

³⁵ Ahmed Bassem Hattab Al-Tu'ma, *The Turkish Ilisu Dam Project and Its Impact on Iraq's Water Rights under International Law and Islamic Sharia (An Analytical Study)*, Doctoral Dissertation, International Islamic University Malaysia, 2016 'p.326

³⁶ Ramadan Ghazal Nu'man, previously cited source 'p.105

The role of bilateral and multilateral international agreements is significant in water cooperation regulations since the agreements determine the rights and responsibilities of the riparian states and create clear regulations of water mutual usage. The agreements usually contain water distribution clauses, the aquatic environment protection, dispute resolution mechanisms, as well as the formations of joint executive bodies. Adherence to such agreements can be regarded as a measure of the maturity of water relations between states and an efficient way to minimize the risk of a conflict.³⁷

Concerning dispute settlement, the international law gives a list of peaceful methods that can be used in case of conflicts between states in the area of water resource usage. The most popular of these mechanisms is direct negotiations that are the most adaptive and are the most common mechanism, as these enable states to find consensual solutions that consider the interests of all parties. The initial stage of any water conflict is often negotiations since they are cheaper and more appropriate in preserving political relations between states.

If negotiations fail, recourse may be made to mediation and good offices, whereby a neutral third party, whether a state or an international organization, intervenes to bring the viewpoints of the disputing parties closer together. This mechanism contributes to reducing tensions and providing an appropriate environment for dialogue without imposing binding solutions on the parties. Conciliation may also be used, which is based on presenting non-binding proposals that help the parties reach a settlement.

In Iraq, the country has entered the midst of a water crisis that far exceeds previous experiences with water scarcity and severe shortages. The decline in the quantity and quality of water, the deteriorated and aging infrastructure, and the inefficient use of water have exposed deficiencies in the current water management system, which has severely affected the social, economic, political, and security situation of the country. The south has experienced repeated breakdowns in basic water supply services in the summer months, which in turn have led to large scale anti-government protests especially in 2018. The existing state of the water sector in Iraq can be interpreted in the context of the tumultuous history of this nation. Iraq is a nation that is characterized by dictatorial regimes that put more emphasis on politics of power than good governance, wars after wars, military intervention, poor security and political instability. These circumstances have made the nation unable to adequately address the water challenges, although the past few years have continued to draw more attention to water issues. This paper develops a critical image of water management in Iraq based on the thorough analysis of the literature, semi-structured interviews and an expert workshop. To be more exact, the authors analyze the way in which the water resources are managed and governed in the eighteen provinces of Iraq. Further analysis of existing practices and issues shows that existing infrastructure is fragmented, old-fashioned, and unsuitable, but the advantage of this approach is to provide a preliminary evaluation of the potential intervention opportunities to reach more effective and efficient water management.

Two key elements that destroy good water governance in Iraq have been examined. The former is the poorly established water allocation system, which denies Iraq the ability to fulfill its water demands, as well as, to effectively handle its mammoth water problem. The second is dysfunctional decentralization, which undermines local water governance and ultimately hinders national water governance. Both structural obstacles limit the implementation of existing strategies and contribute to a widely shared perception that water management is informal, non-transparent, and ineffective. Nevertheless, both undermining factors also provide opportunities to improve the current situation and thereby mitigate water-related security challenges. Developing and implementing an effective and transparent system for water management, including the appropriate and equitable allocation of water resources, is of utmost importance. A series of reforms will also contribute to equity and accountability and will be highly beneficial through their impact on the Iraqi government's other water-related priorities, such as investing in adequate infrastructure or increasing water-use efficiency. As for future water-management decisions, the Iraqi government also needs to determine which among the many water-related challenges should be prioritized and to identify the most useful and effective starting points. This process requires consultation with communities and stakeholders most affected by these decisions.³⁸

The economic, political, and security situation has long prevented the Iraqi government from implementing the much-needed water-governance reforms and from modifying customary water-management and usage practices. Authoritarian rule since the 1980s, successive wars, foreign military interventions, and occupation have had severe consequences for Iraq's water sector, particularly with respect to (physical) infrastructure, patterns of water consumption, and the governance framework. Immediate security threats dominated the political agenda, drained financial resources, and reduced the ability to invest in the (re)construction

³⁷ Salah Khairi Jaber, *Protection of Fresh Water from Pollution in Accordance with the Rules of International Law – Iraq as a Model*, Doctoral Dissertation, Cairo, 2016 ‘p.43

³⁸ Ramadan Ghazal Nu‘man, previously cited source ‘p.106

of outdated, inadequately maintained, and damaged water infrastructure. Aside from years of violent conflict, the sanctions imposed on Iraq hindered the maintenance and modernization of water infrastructure, while also reducing state revenues from oil exports, Baghdad's principal source of income. The constitutional framework also presents obstacles to more efficient water management. After the overthrow of Saddam Hussein in 2003, the new political system and decentralization processes imposed administrative pressure on the water sector. According to the 2005 Constitution, Iraq was to be governed within a federal structure, with power shared between the Iraqi federal government, the regions, and the provinces.

The Constitution defines responsibilities, budgets, and authorities specific to each region to prevent the rise of another authoritarian regime and to create an internal balance of power based on the differing needs of the Kurds—the autonomous region—and the Iraqi provinces. Power-sharing between the federal and regional governments became a fundamental principle of water management and of Iraq's governance structure. To activate the decentralization process, Law No. 21 of 2008 transferred certain ministerial functions to the provinces, such as those of the Ministry of Municipalities, Public Works, Health, and Education (World Bank, 2016). Although Law No. 21 does not explicitly refer to water management, its Article 7.4 addresses decentralization in service delivery in general and enables provinces to prepare investment plans and implement projects within the province (World Bank, 2016).

In light of the above, it becomes clear that the mechanisms of cooperation and the settlement of international water disputes constitute an integrated system aimed at enhancing stability in the management of shared water resources and transforming them from a source of tension into a field of cooperation. However, the success of these mechanisms depends on the extent to which states adhere to the principles of international law and their ability to prioritize the logic of cooperation over the logic of conflict, within an evolving international environment characterized by increasing environmental and geopolitical challenges.

Conclusion

By the end of this work, where the problem of the governance of transboundary waters and the legal issues of controlling the international rivers and seas under the impact of climate change and geopolitical conflicts were discussed, it is evident that the problem of shared waters is no longer an issue of technical or environmental concern, but one of the most important problems with legal, political, and strategic aspects in the modern international system.

The analysis has revealed that the management of transboundary waters is anchored on a complex system of legal standards and international treaties to control the utilization of common water resources in a just and sustainable form. Nonetheless, this system is progressively encountering more challenges as a result of the fast changing environmental trends especially climate change, not mentioning the ever-growing geopolitical tensions between riparian states.

Findings

The study reached a set of scientific findings, the most prominent of which are:

1. That the governance of transboundary waters is a holistic legal and institutional framework to regulate the use of common water resources by states in a just and sustainable way.
2. That the principles of international law, like equitable and reasonable use and non-infliction of serious harm, are the legal basis of water governance, but that they encounter challenges in their practical implementation.
3. Climate change is among the gravest modern issues impacting the amount, quality and allocation of water, and making the management of shared water resources more complicated.
4. The fact that geopolitical conflicts over water are tightly connected to the notions of sovereignty and national security complicates their resolution.
5. That international agreements have helped to control the use of transboundary waters, but their success is determined by the levels of compliance by the states to the agreements.
6. That dispute-settlement mechanisms, including negotiation, arbitration, and international adjudication, are comparatively effective means that need more support at the political and institutional level.
7. International cooperation and water diplomacy is the best method of preventing conflicts and improving stability in managing water resources.

Recommendations

In light of the findings reached by the study, the following recommendations may be presented:

1. The need to create and revise international legal frameworks governing transboundary waters in a way that is compatible with increasingly accelerating climate changes.
2. Empowering the concept of regional cooperation among the riparian states by the means of establishing permanent institutions of the management of common water basins.
3. Holding states accountable to increase the level of data and information sharing on hydrological and climatic issues to achieve transparency and lower the risk of conflict.
4. Enhancing dispute-settlement mechanism that are peaceful, especially arbitration and international adjudication, and strengthening their presence in water-related disputes.
5. Incorporating the aspects of environment and climatic dimension more strongly into international water agreements to make the resources sustainable.

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