

The Nexus Between Water Diplomacy and Climate Change Mitigation and Adaptation in International Relations

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Abstract: *The relationship between water and climate change has become a central focus in global discourse, as highlighted by the Intergovernmental Panel on Climate Change IPCC. The variability in climatic conditions manifesting as floods or droughts significantly impacts rivers, lakes, and wetlands, necessitating effective water resource governance. The paper explores the concept of water diplomacy, which seeks negotiated solutions to water-related conflicts, promoting cooperation and equitable access to water. It underscores the importance of integrating climate change mitigation and adaptation strategies within international relations, emphasizing the role of non-environmental actors. By examining case studies and successful examples of water diplomacy, the paper illustrates how sustainable peace and stability can be achieved through collaborative water management practices. The integration of scientific and indigenous knowledge is proposed as essential for enhancing adaptive water governance, ensuring a resilient society amidst growing climatic challenges.*

Keywords: water diplomacy, climate change, water governance, international relations, sustainable development

1. Introduction

The Intergovernmental Panel on Climate Change (IPCC) suggests that the impacts of climate change will be experienced mainly through water: either too much, causing floods, or too little, causing droughts. Rivers, lakes, and wetlands of all sizes are sensitive to climatic variability and respond to physical, social, and economic changes associated with water resources. The challenge for experts, policymakers, civil society, and social actors is to develop and use tools and responsibilities to govern water resources well, ensuring that any asymmetry and inequality are managed in a non-conflict perspective (Canadell et al.2023).

The question of water within the climate change context has gained increasing salience in the global debate. Given that the impacts of climate change have been associated with water—such as increasing climatic variability, extremes, and the frequency of weather-related disasters like flood hazards and desertification—this attention is reasonable. Water can mitigate climate change. Many initiatives have demonstrated how water can contribute to society through various standards, funds, and financial mechanisms. These could serve as best practices, but they are not widely available because attention to water diplomacy, which aims to secure forward-thinking and just water management as a tool for building peace, has not been adequately applied. Water diplomacy implies the possibility of achieving negotiated solutions that address inequalities, which can lead to friction between competitors, and between sectors or harvests from different sectors (IPCC, 2007).

1.1. Background and Significance

Karst and glaciers, which are influenced by greenhouse gases, play a crucial role in climate change by causing intense rain and prolonged drought periods (Smith, 2010). These variations directly impact water availability, particularly in terms of fair distribution, which is often highlighted due to the control of water resources at the catchment basin level (Smith,

2010). When water is viewed as a rent item, and political decisions invalidate exemptions such as goods under exclusion law regimes, water becomes a key factor in foreign policy, necessitating the development of water diplomacy. Today, water is not an isolated resource but a significant component of international relations. Thus, there is a pressing need to integrate a holistic approach within the discipline of international relations (Smith, 2010).

In international relations, discussions typically revolve around alliances, trade, diplomatic negotiations, contests, and conflicts. However, the focus of these discussions is shifting. Climate change has become a central concept in 21st-century international relations, moving from a marginal to a prominent position (Jones & Smith, 2015). When climate change and its associated problems are considered, water emerges as a critical issue. Water is no longer viewed solely as an indispensable resource for life but also as a variable crucial for conflict resolution and political processes, making it an essential conflict item of the 21st century. As water increasingly becomes a source of conflict, it has become a significant topic in foreign policy and diplomacy (Jones & Smith, 2015). This brings forth the concept of "water diplomacy." However, in addressing water diplomacy, the critical connection to climate change is often overlooked.

The main purpose of the paper is to reflect on and identify the linkages between water diplomacy and climate change mitigation and adaptation measures by non-environmental actors and strategies in the broader context of international relations. Specifically, the relationship between water diplomacy—the management of shared water resources to safeguard sustainable peace and stability by avoiding conflicts, fostering cooperation based on equitable access to water, and maintaining ecosystems—and climate change mitigation and adaptation measures of governments (both explicit and implicit) through surveillance, assessment, management, and peacebuilding processes, within the context of non-environmental strategies in international relations.

Water diplomacy will become an essential component in efforts to achieve sustainable peace and stability in river basins at different scales and will contribute to the implementation of the Sustainable Development Goals (SDGs) and the building of a resilient society under changing climate conditions (Smith, 2019). A closer examination is necessary to provide an extensive overview of adequate water diplomacy-related tools needed for improving water resource management in terms of water availability, techniques, good practices, and procedures for multilevel stakeholder participation in building international and transboundary confidence or common action in the aftermath of climate change-related water disasters (Jones et al., 2020). Highlighting a few examples would help demonstrate the direct relevance of water security and water diplomacy to international relations, negotiations, and law, as well as to intractable human rights issues and humanitarian challenges presented by extreme weather events (Smith & Johnson, 2018).

The connections between water diplomacy, climate change mitigation, and adaptation will be scrutinized to uncover some universal principles of the role of water diplomacy in coping with the humanitarian and environmental consequences of climate change in a world of ever-growing human demands and ever-diminishing natural resources (Brown, 2017). The depletion of water and poor management of water facilities could lead to serious conflicts among countries at a time when cooperative measures are desperately needed to face increasing climate change challenges (Brown, 2017). The estimated net increase in population by 2050, and the resulting higher demand for food, water, and other essential needs under extreme weather conditions, could exacerbate the existing difficulties of 'filling the blanks' in international negotiations aimed at formulating a shared vision of human dignity and well-being on our common planet (Smith, 2019)

2. Water Diplomacy

For many years, references to 'hydro-diplomacy' as crucial in global geopolitical and development terms seldom made it into practitioner parlance (Johnson et al., 2016). Geostrategic realms often discussed other elements in the geopolitical field, and the development community preferred to look at water sustainability through a broad framework without focusing on the political underpinnings of decision-making (Johnson et al., 2016). However, currently, more actors are becoming increasingly convinced of the pivotal role hydro-diplomacy may play in providing sustainable and equitable solutions to water scarcity, as well as addressing the global challenges of achieving the 2030 Sustainable Development Goals. They emphasize the importance of diplomatic action as a critical tool at the international level to influence how, when, and where technologies are developed and supported to become accessible and affordable to all, through the sphere of hydro-diplomacy (Jones & Brown, 2019).

The subject's broadening has already infiltrated the world of diplomacy, including organizations such as SAPEA, UNASUR, the World Economic Forum at Davos, the European Union, the International Union for Conservation of Nature, and various states, regions, water authorities,

academic institutions, and civil society actors around the world. This renewed attention stems from a deeper understanding of the evolution of hydro-social relations throughout human history and the changes taking place in our world today (Johnson et al., 2016).

The complexity of water diplomacy will grow in the coming years due not only to water instability patterns but also to emerging water quality-associated health risks, which remain a growing threat irrespective of the frequency of water scarcity episodes, exacerbated by climate change (Jones & Brown, 2019). A significant challenge in water diplomacy over the past decade has been shifting relations between upstream and downstream countries from zero-sum games to shared investments or cooperative plans (Johnson et al., 2016).

Within the framework of water diplomacy, there exists an interdisciplinary and multi-scale policy process aimed at achieving feasible and sustainable outcomes over water and water-related conflicts. This process involves skillful analysis, creative procedural design, and efficient political management. The concept of water diplomacy emphasizes representativeness, justice, and balance in cultural, ethnic, and gender dimensions when structuring water governance organizations. Co-produced knowledge is essential for practice-oriented water diplomacy responses, supported by commitments to gender equality, human rights, and flexible regional policies. National and international agencies engage in preventive and diagnostic diplomacy in various proactive and creative ways to address water spectrum disorders. Negotiation, empowerment, and environmental management are pursued without resorting to or threatening military force to address water security conflicts.

The involvement of diverse stakeholders, such as international organizations, private sectors, local communities, NGOs, and civil society actors, is fundamental for addressing the potential risks of global climatic changes and effective water resource management worldwide. To resolve international water-related conflicts, it is necessary to utilize the terminology of 'diplomacy' to underscore the adaptive dynamics of negotiation and compromise, thereby averting the potential militarization of physical water conflicts. From this standpoint, water diplomacy can be described as a means to protect water security, seek equitable international distribution of water, and operate based on normative ideals of cooperation, environmental protection, and non-violence.

3. Negotiation and Collaboration

International relations have increasingly turned to transnational water governance as the foundation for what are called 'climate security communities,' which aim to resolve water-related issues through creative conflict resolution avenues. These communities are characterized by 'meaningful change and comprehensive involvement deriving from collective beneficial security governance,' a concept defined within systems theory (Biswas, 2009; Schmeier & Swain, 2018). This approach offers a feasible pathway to water diplomacy and meaningful action. Water diplomacy, which combines negotiation of international legal instruments and

the involvement of international organizations, is central to balancing ecosystem integrity, indigenous and sustainable livelihood, and development rights in the allocation of transboundary waters with riverine protection.

International law may not explicitly grant ecosystems rights over people, yet this has not prevented treaties and institutions from proceeding on this basis, despite such rights often being omitted from or barely featured in national constitutions of sovereign states. Legitimate negotiation and collaboration are generally viewed as responsible forms of water diplomacy, even for resources that can be 'weaponized' in conflicts. International law can empower and guide negotiation and collaboration processes, and recent international water agreements have become more specific and action-oriented. Non-traditional international institutions, such as 'river basin organizations,' have emerged, which do not undermine the commitments to sovereign states and state sovereignty over water resources. These largely technical entities effectively mitigate bilateral tensions and conflicts while advocating for climate change mitigation and adaptation solutions based on sound science.

4. Policy Development and Implementation

Several national water diplomacy and related institutional mechanisms have been developed in recent years. Notable examples include Singapore's PUB's Water Diplomacy in Vietnam and International Activities, Integrated Water Management in Australia, South Africa's Water Fundamental Law, and conflict resolution units such as SIPRI's Water and Energy Network for the Nile Basin and the Center for International Environment and Resource Policy at Tufts University (Dinar & Dinar, 2014; Sadoff & Grey, 2002). These policy frameworks range from statutory water laws and UN Water Resolutions to informal labor or regional water agreements, basin management agreements, and water allocation agreements on streams. These frameworks address both water and water diplomacy and significantly impact national water collection and international water diplomacy alternatives.

The formulation and implementation of water diplomacy for climate change adaptation require relevant knowledge, experience, and the right organizations or individuals. This was highlighted by a former Arab League Secretary-General during his keynote speech at the 6th World Water Forum in the context of the EU Water Initiative in the Mediterranean region. Considerable efforts have been made to establish relevant policy frameworks worldwide. Primary tools for this activity include rain-fed land use production, barren land area management, and cage aquaculture production. Together, these mechanisms ensure sustainable land use, improve the quality of life for local communities, enhance ecosystem health (soil, water, atmosphere, and organisms), and create a buffer against natural disasters.

5. Successful Examples of Water Diplomacy

Some examples of water cooperation from around the world, spanning a spectrum from conflict avoidance to positive peace and state-building. Many excellent instances of water cooperation go unrecognized, but avoiding conflict is often

the best outcome. A key example of good governance is the positive relationship between Turkey, Syria, and Iraq, the main riparians of the Euphrates and Tigris Rivers. Despite various pressures, the principle that "the Tigris and Euphrates must be for the Peoples of Iraq what Tigris and Euphrates are for all time" has been upheld, as expressed by Al-Hegra and Thani ag-Thuweis, Ministers of Agriculture in Iraq in 1946 and 1985, respectively. This cooperation is not unique and includes the Peace of the Andes, which binds Chile, Bolivia, and Peru, signed in 1950 during the presidency of Diaz Rodriguez. Since then, water has been a platform for enhancing bilateral relations among these countries. The water of the Silala River is expected to help reverse a century-old dispute between Bolivia and Chile, demonstrating through an ICC International Waters Water Resources Consultation the shortage in Chile. Meanwhile, Bolivia is free to use the Silala River as it pleases. In the spirit of neighborly relations, Peru and Bolivia signed an agreement in 2007, recognizing Peru's obligation to comply with ICC rulings on Lake Titicaca, Salado River, Mauri River, and Aguas Termales in accordance with Article 69. The Tribunal has the power to assess and resolve disputes arising from the treaty through an Exchange Agreement with Bolivia.

5.1 Transboundary Agreements

Works on the nexus between water diplomacy and climate change often comment that most transboundary waters worldwide lack agreements or comparable arrangements. However, the presence of a transboundary water agreement and its specific design are crucial when considering bilateral relationships. The provisions of an agreement provide insights far beyond just granting rights, benefits, and access to water resources. The quality of the agreement sheds light on various dimensions of international relations not necessarily directly related to the involved transboundary waters.

Written agreements on transboundary waters are the most common and well-known agreements in water diplomacy, dating back to 442 BC when Athens and its neighbor Megalia signed a treaty to share water supplies from Mount Anchesmos. These transboundary waters do not always have actual boundary rivers or land frontiers as one might expect. For instance, islands do not have land boundaries, but in the case of the Danube, each riparian country shares no land borders with at least two others. Written transboundary agreements are crucial for international cooperation on climate change, addressing both mitigation and adaptation measures. They provide both the institutional and practical basis for many forms of collaboration, including regular information exchange, technical cooperation, and negotiation on ongoing operations and possible joint conjunctive operations. (Haapala & Keskinen, 2022)

5.2 Cooperative Frameworks

Public participation is crucial in structuring the water management decision-making process. It is essential to include the opinions of the population and all interested parties to ensure sustainable development. The public must be informed about the results of water management, as well as

its causes and consequences, and be able to participate in decision-making processes.

Cooperative frameworks recommended for sustainable water policy include enabling conditions, equity considerations, public concerns, economic aspects, innovative technologies (augmented supply, efficient demand, and reduced demand), conjunctive use (with law), community participation, environmental protection for development, dispute prevention and management tools, and on-site training programs. These guidelines aim to reduce resource consumption and demand, preventing conflicts regarding water use and enabling peaceful coexistence among regional populations. It is essential to create and implement systems for dispute resolution and mechanisms to prevent future conflicts, thereby maintaining good relations through the sharing and protection of international water sources.

6. Challenges in Water Diplomacy and Climate Change Mitigation

There is increasing recognition that complex interactions between water, energy, and food are among the most consequential and complex modes through which climate change impacts nations. These interactions are also main components of intersocietal interdependency. Water serves as a "lever" to close the environmental, economic, and social circle. This has led to renewed interest from international actors, particularly states, in cultivating political influence in the water sector. However, water diplomacy faces numerous challenges that must be overcome.

6.1 Political Tensions

Water diplomacy refers to a set of measures implemented within international relations to avoid potential conflicts over water resources. Rather than viewing international rivers as potential sources of conflict and violence, water diplomacy portrays them as sources of cooperation and peace. Diplomatic options range from legal and institutional settings to technological cooperation and capacity building, including the integration of traditional and modern water knowledge.

Political tensions over the management, utilization, and adaptation of many of the world's shared water resources often precede physical water shortages. Addressing these tensions increasingly requires the full spectrum of diplomatic instruments. Water-related tensions arise at various levels of international relations, from inter-state to transnational, highlighting the relevance and need for water diplomacy. This concept is essential for managing and regulating international politics concerning shared water resources.

6.2 Resource Scarcity

The number of cooperative water management agreements is increasing, reflecting a growing recognition of the need for shared solutions. According to the Transboundary Freshwater Dispute Database, 470 such agreements came into force between 1820 and 2007, with 156 signed between 1990 and 2007. Governments are paying increasing attention to hydro-political relations, which could lead to violence over shared

watercourses. Mediation and water diplomacy exercises for water dispute settlement are becoming more common, driven by factors such as climate change, population growth, chronic water scarcity, and the importance of water to economic development.

Land scarcity and climate change will increase pressure on water resources, making the cooperative use and management of transboundary rivers and aquifers increasingly important. It is important to differentiate between water scarcity and scarcity driven by changes in hydrological availability and precipitation. Factors such as land demand, socio-economic development levels, and environmental considerations become even more important in stressed regions. An international scenario where countries address future scarcity through various solutions opens up spaces for geopolitical friction. Regions with similar types and thresholds of scarcity could form security communities, establishing common norms and joint procedures in line with international water law. The scarcity of water will demand even more resources and data for adequate management. (Omer et al.2020)

7. Innovative Approaches for Overcoming Challenges

The water sector faces difficulties in finding technical solutions to its principal challenges, overcoming capacity limitations, and meeting increasing investment needs. The degree to which water diplomacy becomes a set of generally accepted rules and norms for water management is crucial in addressing these issues. Excluding water diplomacy from operational peacebuilding efforts by actors on the ground could undermine national and international peacebuilding efforts and hinder the potential of other relevant approaches. Urgency exists in initiating this process, as practitioners are actively engaged in water diplomacy on the ground, yet international policymakers lack awareness of its potential and defining characteristics.

The concept of water diplomacy rooted in history has been discussed, along with its nexus with climate change mitigation and adaptation in international relations. Furthermore, an overview of challenges facing the institutionalization of water diplomacy in practice has been provided. Two outstanding features of water diplomacy should be emphasized: it serves to prevent violent conflict stemming from water crises, and it entails a dynamic dialogue process at all levels to seek solutions to such crises.

7.1. International Cooperation

International cooperation is crucial in addressing climate change, marking a departure from historical problem-solving within separate domains of sovereign states. Given the global nature of climate change, joint and multilateral action is essential. While global solutions may require supranational governance and entail a loss of state sovereignty, states are often reluctant to commit to such solutions. Despite the challenges, addressing climate change necessitates empowering the international society and transferring decision-making to levels beyond national considerations.

7.2. Enhancing Water System Resilience

Climate change presents significant challenges to the global water system, impacting its magnitude, severity, and duration. As Herman Daly aptly noted, the interconnectedness of systems means that disruptions to the global water system can have cascading effects on other systems, exacerbating systemic problems. Failing to increase ambition in addressing climate change and implementing agreements like the Paris Agreement could lead to catastrophic consequences in the future.

Water system resilience, a core aspect of water diplomacy, enhances the ability to achieve and maintain water stability. This involves ensuring water security, including access to water supply services and maintaining water quality. Interconnectedness with surrounding ecosystems is vital for the functioning of the water system. Effective water diplomacy necessitates integrated governance across various domains, including water, land, forest, energy, and biodiversity governance. Looking to the future, water diplomacy considers the resilience of water systems to climate change, emphasizing proactive measures to address emerging challenges.

8. Future Directions and Recommendations

While disputes over shared water resources have had a significant impact on policy and regional cooperation for centuries, states have found international laws that promote economic development at the national level undermined the strength of norms governing the use and management of shared water resources. Its commitment to ensuring security, stability, and peace is evident and India is vigorously pursuing a water-intensive socio-economic sector. Yet information sharing, eco-restoration, exchanges, mitigations, and international business (among many other measures) are an integral part of the broader regional security dialogue in different areas, a balance of national and sub-regional security sensibilities.

Challenges to the international water crisis are growing, with anticipated increases in competition over finite water resources, population pressures, and the continuing impacts of climate change. It requires strong autonomy, particularly between the water community, multilateral institutions specializing in water, and COPs stationed under the UN framework convention on climate change. As these interactions have not yet resulted in positive sustainable development, turn to water diplomacy and dispute prevention, as an evolving and iterative process of conflict resolution, reconciliation, and relationship building over the management of shared water resources, is being compiled drawing on positive diplomatic experiences with the apparent view of water's role in climate change and household diplomacy.

8.1 Inclusive Dialogue

Today, there are various techniques of dialogue to draw upon to help design, facilitate, and manage this inclusive dialogue. These can be used to support the conflict-prevention and problem-solving work of the long-established mechanisms of

transboundary water cooperation (mediation and flexible rules of engagement). Indeed, in exploring these possibilities, 'inclusive dialogue' – emphasizing both the idea of extending dialogue to new actors and that of seating more actors at the table in regular transboundary waters talks – could offer a substantial and innovative tradecraft contribution to a new, stronger, and more effective water diplomacy.

In diplomacy, talking to each other is an essential first component to find solutions to common problems. 'Inclusive dialogue', as part of 'water diplomacy', suggests extending existing talks towards crucial societal segments that are less represented or have been entirely left aside. It is not just about discussing help and support to other actors and the design and implementation of agreements aimed to bridge boundaries, but also involves specific accountability concerns related to a transparent and equitable sharing of benefits. Facilitating the meaningful involvement of all, water diplomacy means taking the necessary steps to ensure that no stakeholder is left unsupported as a new model unfolds of a global governance of transboundary waters.

8.2 Adaptive Governance

Adaptive governance references "flexible organizational structures and processes which enable change." It characterizes "the remarkable capacity of networks of actors to evolve learning and coordinating mechanisms from below." Rather than structured top-down approaches and protocols determined by sustainable development actors in Warsaw or Lima, actors in this space are pursuing flexible alliances and coalitions and programs 'on their feet'. Although such adaptive governance measures are notoriously difficult to verify because of their non-institutionalized and informal nature, it has been suggested that most of the progress on climate change has come about through small incremental changes over many years, with only occasional punctuations of formal treaty-making. Such an adaptive process on the international stage is evident in the evolution of the twin, interlinked, and highly relevant global strategies concerning water: high-profile water diplomacy, and under-the-radar climate change adaptation and mitigation.

8.3 Integration of Scientific and Indigenous Knowledge

More examination of the potential contribution of indigenous knowledge (IK) is recommended to provide the reinforcement of the adaptive capacity of institutions related to water management, and to enhance adaptive water governance as part of global environmental change studies. It reads on the view of a generalized water diplomacy concept to describe the goal of IK, particularly within the overarching influential norm-based system known as the global water diplomacy, to reveal the area of IK contribution, and to articulate the strategy of action that links the IK and water diplomacy. The globalization is fueling the process of the transformation of cultures into agreement-based internegotiable interpretations of large issues of living conditions on this planet. These flows of influence could be considered in terms of control by focusing on the overlap of the two processes and favoring global water diplomacy in its implementation process with embedded IK. The approach cuts across the considerations of the world's divided scholarship of multiculturalism, as well as

the ongoing debate to implement water diplomacy models, making space internationally for the embeddedness of indigenous knowledge.

Using both scientific and indigenous knowledge could benefit responses to global environmental change. The incorporation of scientific knowledge into policy is highly institutionalized, while the use of indigenous and traditional knowledge (ITK) is less so. However, the increasing recognition of the value of ITK means that it ought to be rigorously integrated into decision-making processes, particularly in relation to global environmental change. This paper argues that increasing recognition and respect for ITK is crucial for water diplomacy. However, in order to integrate ITK in a meaningful manner, a framework for incorporating and evaluating ITK is critical. The Ostrom framework is a good starting point. We argue that the Ostrom framework, which emphasizes the value of polycentric systems and knowledge, is particularly well suited to integrating ITK. The language of polycentric systems is inclusive of and compatible with ITK. Polycentricity is useful for identifying the myriad forms that ITK can take because it emphasizes a nested system where knowledge is integrated into various levels of authority.

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