

REVIEW

Putting diplomacy at the forefront of Water Diplomacy

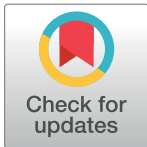
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Abstract

Water diplomacy is a recent term that has been used to analyse hydropolitical dynamics and issues that may arise when discussing transboundary water governance. In fact, the shared nature of transboundary water resources may lead to tension over their allocation and use which can in turn aggravate or harm interstate relations and cooperation. This is important as most freshwater resource systems cross jurisdictional borders, with 153 countries sharing transboundary rivers, lakes, and aquifers. Thus, a coordinated and sustainable management of these resources through water diplomacy is vital. While the concept of water diplomacy has been defined in several ways, we stress the need to emphasise diplomacy and the goals beyond the water field when considering this concept.



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Introduction

The shared nature of transboundary water resources may lead to tension over their allocation and use which can in turn aggravate or harm interstate relations and cooperation. This is important as most freshwater resource systems cross jurisdictional borders, with 153 countries sharing transboundary rivers, lakes, and aquifers. Thus, a coordinated and sustainable management of these resources through water diplomacy is vital. While the concept of water diplomacy has been defined in several ways, we stress the need to emphasise diplomacy and the goals beyond the water field when considering this concept.

The origins of the concept of water diplomacy

In the 1990s, the water wars narrative had extensive coverage in mass media. Nevertheless, scientific research demonstrated the need to be wary about such narrative, showing that the instances of transboundary water interactions historically has been more cooperative than conflictive. Mirumachi [1] has then also showed the need to consider cooperation and conflict over shared water resources as co-existing. The water wars narrative has been relaunched in the past decade, linking it to climate change. In its new shape, climate change will be negatively impacting water resources quantities, and therefore the risk of conflicts and wars over shared water resources—according to this narrative—will increase. In this context, water diplomacy as a

concept has become trendy and increasingly used since 2010, serving as a response to the water wars narrative.

Water diplomacy is becoming increasingly important especially in water scarce regions, such as the Middle East and North Africa (MENA)—the most water scarce region in the world. Water diplomacy is therefore important for: driving towards more sustainable use of shared water resources in complex settings; preventing the national securitisation of water resources; reducing the risk of water conflict; and altering national discourses to promote regional stability, security, and peace. Water diplomacy plays an important role in encouraging the joint action needed in the case of shared resources, where independent action has been the norm, despite the negative externalities independent action may cause [2,3]. The focus on mutual gains from the use of water—including ecosystem services, hydropower, and water for irrigation—is also important. Islam and Repella [4] consider how water diplomacy's significance comes from its recognition of the context in which issues with cooperation occur, in order to address competing interests in conjunction with uncertainty. The importance of water diplomacy is highlighted by comparing historic, local, more fragmented water management systems with the interdependent and regional systems required to cope with complex water problems and the cooperation needed to enable such collaboration [4].

Furthermore, water diplomacy is important because it prevents the national securitisation of shared water resources that face competing demands. In settings that are not characterised by cooperation and that face increasingly severe resource shortages, securitisation of water is likely. The competitive policies entailed by securitisation often have negative implications on water resource management due to acting as a further barrier to cooperation. Wienthal, Zawahri and Sowers [5] explored the drivers and negative implications of securitisation, demonstrating how protective policies, adopted when water (and the broader water-energy-food nexus) is securitised, erode opportunities for cooperation, due to states prioritising their own security over regional security. Water diplomacy acts as a key method of de-securitisation; in fact, through gaining a deeper understanding of context, it avoids unproductive discourses of securitisation that lack justification when considering the issue holistically.

Water diplomacy also cultivates positive and productive discourses on issues surrounding shared water resources, which in turn affect how agents act. A constructive discourse encourages the sharing of knowledge and trust building. Discourse has the potential to present management issues from a productive, regional security viewpoint to frame interests so that they are mutually compatible [6,7]. Krampe, Hegazi, and VanDeveer [8] deepen the discussion surrounding discourse by exploring how a focus on natural resource management can result in competitive discourse, framing the use of water resources as a zero-sum game. They highlight the importance of the more flexible discourse water diplomacy adopts, avoiding the perception of water resources as finite. This can be considered as changing the agents of security, as suggested by Fröhlich [7], which in turn alters threat perceptions and associated responses. Similarly, Islam & Repella [4] consider the positive impact of adopting a “know-why” perspective in discourse, in order to explore the ways in which values and interests affect how a water issue is defined and consequently what tools are used in response. Moreover, discourses can frame the water issue as a win-win game, in which everyone benefits from cooperation, either in terms of water resources or from the benefits of the use of water.

Defining the term

The concept of water diplomacy has been emerging since the 1990s with an emphasis not on the technical aspect of water governance but rather on its political setting and implications [9: 200–221]. Defining this practice has been a complex and heavily addressed issue due to the

Table 1. Four main themes of water diplomacy across the literature.

Aspect	Theme
1. Process oriented- definition • Tomalova and Ullrichova [11]	Water diplomacy is defined through the actors involved and the levels it entails, i.e., local, regional, national, international.
2. Water centric definition • Klimes, Michel, Yaari, and Restiani [2] • IHE Delft [12] • Zareie, Bozorg-Haddad, and Loáiciga [13]	Water diplomacy is a process that looks to improve the governance of water resources and increase cooperation over these resources.
3. Wider scope/separation from water cooperation definition • Molnar, Cuppari, Schmeier, and Demuth [3] • Schmeier and Shubber [14]	Water diplomacy has a broader scope in bringing about regional peace and stability, and potentially fostering regional integration.
4. All-encompassing definition • Keskinsen, Salminen, and Haapala [15] • Sehring, Schmeier, Horst, Offutt, and Sharipova [9]	Water diplomacy is a process which operates at multiple levels with various actors which aims to resolve water issues and conflicts and contribute towards wider regional integration and cooperation.

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variety of actors, frameworks, disciplines, and contexts involved. Despite this, the term is often used without context as a ‘buzzword’ [9: 200–221], as often happens with new terms, bringing its utility into question [10].

This review paper argues that water diplomacy is, and can be, a useful term if it is clearly defined. A clear and concise definition will provide value to the process as a productive concept that can thus be used appropriately within the discourse. We must look first at how the term has been defined across the literature thus far. In doing this, in Table 1 we identify four main ways in which water diplomacy has been defined. These are: process-oriented; water-centric; definitions outside of water related issues; and the most recent all-encompassing definition which attempts to include all of the above.

The first process-oriented definition centres around what the process of water diplomacy looks like; this mainly includes what actors and stakeholders are involved, and at what level this takes place. There are many levels to the diplomacy process, often grouped into tracks. Track 1 diplomacy involves official discussions between political and military leaders (state to state). Track 2 diplomacy involves unofficial dialogue by non-state groups such as academics and NGOs. A mixture of these two groups constitutes track 1.5 diplomacy, while track 3 diplomacy involves private groups and individuals at a grassroots level. Tomalová and Ullrichová [11: 471–479] adhere to a process-oriented definition where they use the level at which water diplomacy takes place as the key defining feature of water diplomacy. They see water diplomacy as involving all levels from small scale projects at a local level to formal diplomatic relations and interstate negotiations. Water diplomacy is thus seen as a multi-track process.

The second definition of water diplomacy is a water-centric one. This definition focuses on how water diplomacy can resolve water-related issues and foster improved water cooperation and governance. Klimes, Michel, Yaari, and Restiani [2: 1362–1370] define water diplomacy in terms of the establishment and consequent enhancement of cooperation surrounding shared water resources while Zareie, Bozorg-Haddad, and Loáiciga [13: 2338] consider it to be “an innovative approach and strategic tool” in the resolution of conflicts surrounding the sharing of water resources. Honkonen and Lipponen [16: 321–331] see water diplomacy strictly in the realm of water related issues between states. At times, this type of definition is not too dissimilar from water cooperation and has seen the terms often being used interchangeably.

The third definition goes beyond a sole focus on water related issues. Molnar, Cuppari, Schmeier, and Demuth [3] argue that water diplomacy has a much wider end goal than water-

centric definitions suggest. Water diplomacy is seen as having a broad scope that can potentially bring about regional cooperation, peace, and stability. Schmeier and Shubber [14: 114] also recognise this wider outreach of water diplomacy with its ability to enhance cooperation in the achievement of goals beyond water management that aid regional stability. The EU recognises the potential that water diplomacy has to solve issues outside of the water sector, affirming “diplomatic engagement on water, especially transboundary water cooperation, as a tool for peace, security and stability” [17]. This understanding of water diplomacy recognises the potential that water diplomacy has to bring about more than just water cooperation and improved water governance. Water diplomacy can contribute towards broader regional cooperation, stability, peace, and security.

The most recent scholarship has typically tended to adopt an all-encompassing definition of water diplomacy incorporating all the three previous definitions. Water diplomacy is defined as including both water-related issues and wider issues as well as occurring across multiple levels with various actors. Keskinen, Salminen, and Haapala [15: 3–4] propose that water diplomacy consists of five key aspects, these being political, preventive, integrative, cooperative, and technical. These five aspects give a general definition for water diplomacy as a dynamic political process intended to “prevent, mitigate, and resolve” conflicts surrounding shared water resources, through multiple tracks of diplomacy. Sehring, Schmeier, Horst, Offutt, and Sharipova [9: 212] take a similar approach by recognising the complexity of the process and the broader scope of water diplomacy. Their definition accounts for the deliberative nature of water conflict prevention, mitigation and resolution via “foreign policy means, embedded in bi- and/or multilateral relations beyond the water sector and taking place at different tracks and levels” [9: 212]. These recent definitions incorporate all aspects of water diplomacy, including water related issues such as water cooperation and governance as well as issues which have a wider scope, chiefly peace, security, and stability.

It is also important to mention that water diplomacy has often been used interchangeably with the following terms: water management, water cooperation. However, our understanding of (transboundary) water management is when the discussions and conversations are focused on merely water issues; water cooperation instead focuses on how to increase water resources by making the pie bigger and by identifying win-win solutions that go beyond negotiations on water quantities and allocations by involving considerations of how to allocate the benefits from the use of water. Our understanding is that water diplomacy, instead, goes beyond these two terms by focusing on issues that deal with peace, security, and stability.

Benefits and best practices

Water diplomacy has wide-ranging benefits. If we take the water-centric definition, this can facilitate the proper management of water resources. This is particularly beneficial in water-scarce regions where the securement and efficient management of water resources is vital to the health of people. Perhaps more importantly, if we take the definition of water diplomacy in its broader scope, we can see benefits that go past water security, and that incorporate foreign policy goals [9]. Water diplomacy can serve as a means by which to secure wider foreign policy goals, particularly regional stability and peaceful relations between states. Water diplomacy produces positive discourses which can help frame wider interests so that they are perceived to be mutually compatible, in this way, issues can come to be seen as a win-win game in which everyone benefits [6,7]. Concomitant with this is the mitigation of the perceptions of threat between states, thus fostering a framework in which cooperation is feasible.

With these benefits in mind, it is useful to draw out the instances where these benefits were produced in practice. There have been many cases where water diplomacy has been put into

practice with a high degree of effectiveness. The most striking example is the Indus Waters Treaty of 1960, which decreased the conflictual relations between India and Pakistan. Water rights over the Indus River system were at the centre of an Indo-Pakistani dispute [18]. This demonstrates the two primary benefits as outlined above, in settling a specific water dispute and contributing to wider peace and stability in a broader Indo-Pakistani conflict. Other examples include the signing of several agreements in 1994 covering Lake Victoria, and on a broader scale, UNESCO has been a paragon of water diplomacy in practice, it has continually aided water governance. So, we can see that water diplomacy has a diverse set of benefits which were best demonstrated in the 1960 Indus Waters Treaty.

Operationalising water diplomacy

This section discusses how to operationalise water diplomacy. First, it details how an agreed understanding of data enables agreements to be based on robust evidence. Second, it explains how effective governance structures ensure that agreements are implemented and maintained. Third, it describes how public participation helps to increase trust in joint bodies and agreements as well as in preventing the reinforcement of inequality. Fourth, it shows how third-party involvement helps to encourage and sustain cooperation. Finally, it stresses the importance of water diplomacy being informed by an in-depth understanding of the environmental costs and benefits.

The management of water resources is inherently political with outcomes depending on political relations between stakeholders. However, a precondition for effective water diplomacy is the ability to base decisions on mutually understood and agreed upon data. This entails experts who can identify the relevant data, know how to collect it, and know how to validate and interpret it. In addition, the data must be accurate and accessible. An agreed understanding of data therefore requires technical capability and cooperation on data. Water diplomacy should be informed by a professional community of water experts that have the skills to bridge disciplines and collaborate to find joint solutions. Technical and interdisciplinary expertise is critical to understand and process data as well as to formulate and discuss joint paths forward. Cooperation on data enables the availability of accurate and accessible information that can inform diplomacy and reduce the space for misunderstanding and conflict. At the rudimentary level of data collection, differing access to and interpretation of data can lead to disagreements. Without mutual agreement on the basic facts and on how and what data will be collected and by whom, it is challenging to reach mutual agreements. Uncertainties and differing opinions over data can lead to its politicisation. Thus, data must be shared between the relevant parties for them to come to a basic agreement on the core facts and the nature of issues at play. Cooperation over data not only informs diplomacy but is also an effective way to build relationships between parties by increasing transparency and trust. Cooperation over data can sometimes lead to the creation of a mechanism to ensure consistent and transparent data exchange. Such a mechanism can lay the foundation for institutionalised cooperation.

One approach to water diplomacy, which Wong [19] calls the Mainstream Approach, argues that the biggest challenge to water diplomacy is the absence of properly managed governing structures. Consequently, followers of this view argue for the establishment of new water commissions and organisations to support and facilitate dialogue and negotiations between countries as well as to strengthen existing arrangements. Many argue that international organisations are established to surmount the collective action challenges raised by transboundary water management [20–22]. International organisations, such as river basin organisations (RBOs), provide mechanisms for negotiation, manage the implementation of agreements and help find a common ground for benefit-sharing. Shubber and Schmeier [14]

claim that RBOs provide institutional anchors for collaboration by establishing platforms for regular engagement between member states. Honkonen and Lipponen [16] state that joint bodies are indispensable players because they foster institutionalised cooperation. Without effective organisation, agreements and treaties will not be well implemented and stakeholders may lose trust in the process. Schmeier [23] defines the effectiveness of RBOs as “the extent to which an RBO contributes to behaviour changes among riparian actors, ultimately contributing to the solution of the collective action problem that prompted the RBO’s establishment and the promotion of joint governance of water-related collective action problems in the basin” [23: 26]. To achieve this, international organisations need to be backed by an appropriate and sufficient organisational structure.

This also requires transparent management and mechanisms for compliance and disputes resolution. RBOs would need to ensure transparency in their management and data with clearly defined responsibilities for local institutions. In addition to this, there must be free and regular exchange of information, data and dialogue. This can be aided by the translation and digitalisation of data, for instance by translating documents into all the riparian languages, which allows access for all stakeholders. The digitalisation of data can further promote accessibility. Finally, governance structures will not be sustainable unless their framework is adaptable. Water resources are not static and always involve a certain level of uncertainty and change. Climate change exacerbates this with changing climate patterns and higher variability in precipitation. Furthermore, water demand is continually changing due to demographic changes, which may be affected by economic development as well as by immigration. This therefore generates a need for organisations and treaties that can be adapted/revised so that they can remain relevant and workable. International organisations need to be established with impartial and enforceable procedures for settling disputes. An international organisation must be able to enforce strategies and principles while also having space for grievances to be raised. This can be achieved through early warning mechanisms, accountability mechanisms and defined processes for conflict management. These procedures are necessary for confidence in an organisation and the implementation of its policies.

A second approach to water diplomacy, what Wong [19] labels the Critical approach, argues that, by solely focusing on institutional agreements, there is a risk of neglecting local capacities and needs [19,24]. International organisations’ over-centralised approach tends to meet the interests of national governments and international donors as opposed to the poor communities involved [19]. Suhardiman, Giodarno, and Molle, [24] posit that this centralisation creates problems of ‘institutional dissonance’ whereby responsibilities are devolved in a top-down manner from the national to the local without taking account of local needs and capacities [24]. The Critical approach instead argues for decentralised institutions that promote the participation of local communities and stakeholders in the decision-making process.

For an international organisation to be widely trusted and respected it must be inclusive of all stakeholders. For a given water resource there are contending demands and competing interests of multiple stakeholders across various levels, regions, and time frames. For instance, there are differing water interests of rural and urban populations. Effective water diplomacy must seek to reconcile all the competing interests through engagement platforms properly linked to formal processes [25]. These platforms require intentionally designed entry points to enable participation also by the most disadvantaged stakeholders [2]. Islam and Susskind [26] call for wider stakeholder engagement through thorough stakeholder identification and inclusive processes while Grech-Madin, Döring, and Swain [27] argue for inclusion of stakeholders also at sub-national levels. Through increasing public engagement in water governance, the public will have a greater understanding of the problems they face and will be more willing to invest and take risks to protect a valued resource [2,28].

Women are a stakeholder group that have been underrepresented in water diplomacy. Women have a particularly strong interest in water because they usually have the responsibility of fetching it in developing countries. In fact, they are responsible for water collection in eight out of ten households with water off the premises [29]. They thus have a critical interest in the management of water. The inclusion of women in water diplomacy helps minimise the continuation of gender inequalities whilst encouraging a holistic water management approach [30]. Thus, water diplomacy should actively include women at all levels—data collection, negotiations, implementation of policy etc. This can be achieved through employment quotas, affirmative action, and specific training for women. Moreover, addressing this embedded inequality requires an enhanced “understanding of the underlying power dynamic and structural barriers that reinforce gender inequalities” [31]. The Women in Water Diplomacy in the Nile Network (WIN) enables the connection of female leaders across the Nile Basin, strengthening their water management capacities through educational activities.

However, the Critical approach has been accused of romanticising community participation and not accounting for the vulnerability of emergent collaborative spaces to elite capture. Fritzen [32] argues that elites tend to dominate democratically elected committees due to their greater power, connections and resources. Wong [19] details a case study on the Volta River Basin between Ghana and Burkina Faso to demonstrate how stakeholder participation is not always beneficial for all stakeholders. This example of transboundary water governance is one of the few cases where local participation was experimented with and where there was a quota system to ensure women representatives. In this basin, a water committee was established with local members nominated from each rural community. This was intended to give local stakeholders a say in water governance. However, the criteria for nominating individuals included their level of commitment, number of meetings they could attend and social respect within their communities. This led to local elites, who did not share the views of poor farmers, dominating the positions. Moreover, most of the women nominated were already successful and well-connected and so their inclusion did not expand women’s participation. Their participation also did not guarantee policies that benefitted other women with women becoming the victims of the ban on fuel collection. Overall, Wong’s case study shows that stakeholder participation does not necessarily benefit those in question when an institution is built on existing local traditional authority structures. These customary structures mean local elites are better placed to capitalise on “participatory spaces and make decisions on behalf of their communities” [33]. Thus, even when international organisations actively try and include local stakeholders, this can lead to the reinforcement of power asymmetries in rural communities. Berry [34] claims that when “new institutions are imposed, they overlap with, rather than supersede, existing institutions.” International organisations should scrutinise traditional local governance structures before intervening to make sure any subsequent diplomatic reforms are specific and contextually rooted.

Water diplomacy raises political and often contentious questions that can lead to tension and non-cooperation between the involved parties. Michel [35: 2] argues that many shared water resources facing worsening water stress are characterised by distrust between stakeholders thus preventing the establishment of sustainable cooperation. Mediation by a third party during and after negotiations is often crucial to reach agreements and to subsequently implement them [36]. This involvement may come from neighbouring governments or other non-riparian states, intergovernmental organisations, development agencies, NGOs, or other actors who are neither direct stakeholders in the shared water resource nor participants in each water conflict. These neutral third parties can facilitate different forms of unofficial dialogue or interactions between state and/or nonstate parties [35]. The role that such mediators can play varies over the geographical scale, type of service offered and depth of the involvement [36]. The

OSCE's neutral, trusted forum offers a valuable platform for collaboration among its member state and has promoted water diplomacy in several river basins through developing and signing water treaties; establishing and supporting bilateral management bodies; fostering data sharing; developing capacity; and encouraging greater participation in water management. UNESCO is also an example of a third party that continually aids water diplomacy.

Third-party water diplomacy can be implemented through a variety of diplomatic instruments such as promoting the advancement of international water law; supporting national and regional organisations; running capacity-building trainings; and mediating formal negotiations and facilitating informal stakeholder dialogues [35,36]. Third parties can encourage compromise during negotiations using the carrot and stick approach [37–44]. This approach can be financial, such as the World Bank's funding for the implementation of the Indus Rivers Treaty, or knowledge-based via technical assistance, capacity-building programs, and RBO technical committee envoys [36]. Developing states can use the assistance of mediators to design effective joint river commissions that will maintain cooperation after the mediator has departed [41–44].

Third party involvement can encourage “conflict reduction, enhance actor capabilities, promote cooperative and inclusive rules-in-use, and help conflicting parties to structure the collective problem-shed so as to create and realize opportunities for mutual benefits” [35]. This can lead to benefit-sharing solutions and the establishment of a treaty or governing body that helps institutionalise collaborative governance approaches [35,45]. For example, in 1994, active engagement by third parties led to the signing of several agreements covering Lake Victoria [46]. Similarly, intervention by the World Bank between 1952 and 1960, mediating disputes and assisting negotiations, led to the signing of the Indus Waters Treaty between India and Pakistan.

There are a few potential drawbacks of third-party engagement. Firstly, Zawahri [43,44] points out how the norms third parties may bring to the negotiating table might contradict the needs of the riparian states. Lautze and Giordano [46] examined river treaties in Sub-Saharan Africa and found that third party mediators encouraged the use of practices and standards consistent with principles in developed states but possibly counterproductive to the needs of Sub-Saharan Africa. Secondly, if the riparian states are not interested in cooperating, mediation efforts often become futile [43,44]. For instance, the 1955 Johnston Agreement mediated by the USA over the Jordan River failed to be signed by the riparian states. This failure resulted from the political conflict in the region [47,48]. Thirdly, third party involvement often ends with the establishment of a treaty or organisation which riparian states are then free to disregard. Waterbury [49: 6] notes that the prevention of free riding by signatories once a project is implemented can be hard to enforce. Despite this, overall, the existing literature suggests a positive relationship between third party mediation and the resolution of water conflicts [37,38,40–44,50,51].

Finally, water diplomacy must be informed by an in-depth understanding of the environmental costs and benefits. “Rivers are a central feature of the ecology of the planet” [52: 391] and thus solutions to their management should not only be concerned with political and economic outcomes but also how they impact the ecological system. Ecological factors are important to consider in water management both because they are influenced by management decisions and because they can greatly affect management outcomes by affecting the provision of ecosystem services [53]. They are also increasingly important to acknowledge as growing populations and industrializing societies reduce water flows, erode water quality, and destroy fish stocks [52]. Rees and Reed [53] define ecological factors as any ecological phenomenon (e.g., a species, population, ecosystem function, ecosystem structure, etc.) that are affected by water management. Sadoff and Grey [52] propose a framework that categorises four types of

benefits from water diplomacy—environmental, direct economic, political, and indirect economic. The environmental type entails increasing benefits to the river: tackling degraded water quality, watersheds, wetlands, and biodiversity in the hopes of creating a sustainable outcome. They argue that pursuing ecological benefits to the river not only aids the river but can bring benefits to all and “may even be a pre-requisite for deriving benefits from the river” (p. 395). Van Rees and Reed [53] provide a case study from O’ahu, Hawaii where water management focused on economic benefits such as irrigation while ignoring the environmental impacts on systems that rely on runoff or infiltration. As a result, originally simple problems grew to complex issues with poor quality runoff impacting nearby ecosystems and increased flood-risk due in part to land-development related wetland loss. Authors writing for the Stimson Centre corroborate the damaging effects of ignoring ecological factors, arguing that such reductionism leads to win-lose outcomes. Thus, they call for a more holistic paradigm based on transdisciplinary thinking that includes acknowledgement of hydrological cycles and natural ecosystems. Similarly, Zawahri [43,44] proposes an approach of managing international rivers that is both economically and ecologically optimal, respecting the relationship between water and its surrounding environment. Rees and Reed [53] propose a specific method to incorporate ecological factors into water diplomacy whereby ecological interests are treated as “surrogate stakeholders” in water negotiations. They argue that rather than being treated as constraints and trade-offs that are introduced post negotiations, ecological phenomena should be introduced from the start. Acknowledgement and inclusion of ecological interests can add value to ecosystem services and lead to mutual gains and non-zero-sum outcomes. Overall, therefore, for water diplomacy to be sustainable it must consider ecological factors and ensure that decisions reached do not harm the environment.

Conclusion

This paper highlighted the return to the water wars narratives and discourses within discussions about climate change. Climate change is said to further increase the risk of water wars according to mass media. Consequently, the concept of water diplomacy became more and more trendy, deploying and calling for its use to counter the risk of water wars. Water diplomacy goes beyond the concepts of transboundary water cooperation by using water as an entry point to aim to increase regional cooperation, peace, stability, and security. In this context, this paper identified how this concept can be implemented and its key features.

In a nutshell, effective water diplomacy depends on five critical elements: an agreed understanding of data, an effective governance structure, public participation and stakeholders’ involvement, third-party support, and inclusion of ecological considerations. An established and mutual understanding of data ensures that all agreements and treaties are based on accurate and robust evidence. Effective governance structures establish channels of communication between riparian states for the collective implementation and maintenance of agreements. Public participation and stakeholders’ involvement enable agreements to respond to local needs and benefit from local participation. Third party support can facilitate dialogue, capacity building and monitoring which helps riparian states to optimise the mutual benefits. Attention to ecological factors ensures sustainability of water management and can aid mutually beneficial outcomes.

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References

1. Mirumachi N. (2010). Study of conflict and cooperation in international transboundary river basins: The TWINS framework (Doctoral dissertation, King's College London (University of London)).
2. Klimes M., Michel D., Yaari E., Restiani P. (2019) Water diplomacy: The intersect of science, policy and practice, editorial, *Journal of Hydrology* 575 (2019) 1362–1370. <https://doi.org/10.1016/j.jhydrol.2019.02.049>
3. Molnar K., Cuppari R., Schmeier S., Demuth S. (2017) "Preventing Conflicts, Fostering Cooperation—The many Roles of Water Diplomacy", UNESCO International Centres for Water Cooperation and for Water Resources and Global Change.
4. Islam S., Repella A. C. (2015) Water Diplomacy: A Negotiated Approach to Manage Complex Water Problems. *Journal of Contemporary Water Research & Education*, 155. <https://doi.org/10.1111/j.1936-704X.2015.03190.x>
5. Weinthal E., Zawahri N., & Sowers J. (2015). Securitized water, climate, and migration in Israel, Jordan, and Syria. *International Environmental Agreements: Politics, Law and Economics*, 15, 293–307.
6. Ide T. and Fröhlich C. (2015) Socio-environmental cooperation and conflict? A discursive understanding and its application to the case of Israel and Palestine. *Earth System Dynamics*, 6(2), pp. 659–671.
7. Fröhlich C. (2020) 'Desecuritisation of Water as a Key for Water Diplomacy', in Maghen L. and Kronich S., *Ensuring Water Security in the Middle East: Policy Implications*. Euromesco.
8. Krampe F., Hegazi F. and VanDeveer S. (2021) Sustaining peace through better resource governance: Three potential mechanisms for environmental peacebuilding. *World Development*, 144, p.105508.
9. Sehring J., Schmeier S., Horst R. t., Offutt A. and Sharipova B. (2022) 'Diving into Water Diplomacy—Exploring the Emergence of a Concept', *Diplomatica*, pp. 200–221.
10. Hussein H., Ezbakhe F. (2022) The Water-Employment-Migration nexus: a buzzword or a useful framework?, *Development Policy Review*.
11. Tomalová E. and Ullrichová E. (2021) 'Water Diplomacy—The New Modus Operandi of EU Diplomacy? Innovative Methods in Diplomatic Practice' *The Hague Journal of Diplomacy* 16.4.
12. Delft IHE. (2022) 'Water Diplomacy Services of IHE Delft to Promote Water Cooperation'.

13. Zareie S., Bozorg-Haddad O. and Loáiciga H.A. (2021) 'A state-of-the-art review of water diplomacy', *Environ Dev Sustain* 23.
14. Schmeier S., Shubber Z., (2018) Anchoring water diplomacy—The legal nature of international river basin organizations. *Journal of Hydrology*, 567, pp.114–120.
15. Keskinsen M., Salminen E. and Haapala J. (2021) 'Water diplomacy paths—An approach to recognise water diplomacy actions in shared waters', *Journal of Hydrology*, Volume 602, 126737.
16. Honkonen T., Lipponen A. (2018) Finland's cooperation in managing transboundary waters and the UNECE Principles for Effective Joint Bodies: Value for water diplomacy *J. Hydrol.* 567, 320–331.
17. Council of the European Union. (2021) 'Water in diplomacy: Council confirms EU's commitment to enhanced EU engagement'.
18. Bakshi G., Trivedi S. (2011) *Indus Equation*, Strategic Foresight Group.
19. Wong S. (2016) A post-critical perspective to community participation in transboundary water governance—a case study of the Volta River Basin in West Africa. *Geoforum* 77 (2016), 83–92.
20. Axelrod R., Keohane R. (1985) Cooperation under anarchy: strategies and institutions. *World Politics* 38 (1), 226–254.
21. Abbott K.W., Snidal D. (1998) Why states act through formal international organizations. *J. Conflict Resolut.* 42 (1), 3–32.
22. Martin L., Simmons B. (2012) International organizations and institutions. In: Carlsnaes W., Simmons B., Risse T. (Eds.), *Handbook of International Relations*, second ed. Sage, London.
23. Schmeier S. (2013) *Governing International Watercourses: River Basin Organizations and the sustainable governance of internationally shared rivers and lakes*. Oxfordshire: Routledge Taylor & Francis.
24. Suhardiman D., Giodarno M., Molle F. (2012) Scalar disconnect: the logic of transboundary water governance in the Mekong, *Global Water Forum Discussion Paper 1234*, Canberra, Australia.
25. UNEP. (2009) *Hydropolitical vulnerability and resilience along international waters—North America—2009* (2009, United Nations Environment Programme: Nairobi).
26. Islam S., Susskind L. (2018) Using complexity science and negotiation theory to resolve boundary-crossing water issues. *J. Hydrol.* 562, 589–598.
27. Grech-Madin Ch., Döring S., Ashok Swain Kim K. (2018) Negotiating water across levels: a peace and conflict "Toolbox" for water diplomacy. *J. Hydrol.* 559 (2018), 100–109.
28. Huntjens P., Yasuda Y., Swain A., De Man R., Magsig B., Islam S. (2016) *The Multi-track Water Diplomacy Framework: A Legal and Political Economy Analysis for Advancing Cooperation over Shared Waters*. First edition, The Hague Institute for Global Justice, 2016.
29. WHO and UNICEF (2017). *Progress on drinking water, sanitation and hygiene: 2017 update and SDG baselines*. World Health Organization (WHO).
30. Ospanova S., Jafarzadeh S., Sechi G., Muminjoniyon A., Delgado J. V., Mukhamedova N., et al. (2020) *Gender Mainstreaming in Water Governance in Central Asia*. Organization for Security and Co-operation in Europe (OSCE).
31. Water Governance Facility. (2014) *Mainstreaming Gender in Water Governance Programmes: From Design to Results*. WGF Report No. 4, SIWI, Stockholm.
32. Fritzen S. (2007) Can the design of community-driven development reduce the risk of elite capture? Evidence from Indonesia. *World Dev.* 35 (8), 1359–1375.
33. Platteau J.P., Somville V., Wahhaj Z. (2012) *Elite capture through information distortion: a theoretical essay*. Centre of research in the Economics of Development.
34. Berry S. (1993) *No Condition is Permanent: The Social Dynamics of Agrarian Change in Sub-Saharan Africa*. University of Wisconsin Press, London.
35. Michel D. (2020) *Water Conflict Pathways and Peacebuilding Strategies* (No. 164). United States Institute of Peace.
36. Van Genderen R., Rood J. (2011) "Water diplomacy: A niche for the Netherlands?", *Hague Institute of International Relations*.
37. Nakayama M. (1997) "Successes and Failures of International Organizations in Dealing with International Waters." *Water Resources Development* 13, 3: 367–382.
38. Biswas A. (1999) "Management of International Waters: Opportunities and Constraints." *Water Resources Development* 15, 4: 429–221.
39. Elhance A. (2000) "Hydropolitics: Grounds for Despair, Reasons for Hope." *International Negotiation* 5, 2: 201–222.

40. Salman S. M., & Uprety K. (2021). Conflict and cooperation on South Asia's international rivers: A legal perspective. BRILL.
41. Weinthal E. (2000) "Making Waves: Third Parties and International Mediation in the Aral Sea Basin," in Greenberg Melanie and Margaret McGuinness, editors, *Words Over War*. Lanham, MD: Rowman and Littlefield Publishers.
42. Weinthal E. (2002). *State Making and Environmental Cooperation: Linking Domestic and International Politics in Central Asia*. Cambridge, MA: MIT Press.
43. Zawahri N. (2006) "Stabilizing Iraq's Water Supply: What the Euphrates and Tigris Rivers Can Learn from the Indus." *Third World Quarterly* 27, 6: 1041–1058.
44. Zawahri N. (2009) Third party mediation of international river disputes: lessons from the Indus River. *International Negotiation*, 14(2), pp. 281–310.
45. Phillips D., Daoudy M., McCaffrey S., Öjendal J., Turton A. (2006) *Transboundary Water Cooperation as a Tool for Conflict Prevention and for Broader Benefit-sharing*. Ministry of Foreign Affairs Sweden, Stockholm.
46. Lautze J., Giordano M. (2007) "Demanding Supply Management and Supplying Demand Management." *Journal of Environment and Development* 16, 3: 290–306.
47. Haddadin M. (2000) "Negotiated Resolution of the Jordan-Israel Water Conflict." *International Negotiation* 5, 2: 263–288.
48. Haddadin M. (2002) *Diplomacy on the Jordan: International Conflict and Negotiated Resolution*. Boston: Kluwer Academic Publishers, 2002).
49. Waterbury J. (2008). *The Nile Basin: National determinants of collective action*. Yale University Press.
50. Alam U. (1998) "Water Rationality: Mediating the Indus Waters Treaty." Unpublished dissertation. Durham, U.K.: University of Durham.
51. Giordano M., Giordano M., Wolf A. (2005) "International Resource Conflict and Mitigation." *Journal of Peace Research* 42, 1: 47–65.
52. Sadoff C. W., & Grey D. (2002). Beyond the river: the benefits of cooperation on international rivers. *Water policy*, 4(5), 389–403.
53. van Rees C., & Reed J. M. (2015). Water Diplomacy from a Duck's Perspective: Wildlife as Stakeholders in water management. *Journal of Contemporary Water Research & Education*, 155(1), 28–42.