#### Scientific article





## Water diplomacy: an important tool for climate change mitigation and sustainable development

Diplomacia da água: um instrumento importante para a atenuação das alterações climáticas e o desenvolvimento sustentável

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#### Abstract

A key instrument for combating climate change, preserving the environment and promoting sustainable development is water diplomacy. For this reason, in this article, the authors look at the various aspects of water diplomacy, including international collaboration, cross-border water protection, data exchange, ecological protection, flood management and global food security. Given that water transcends borders, the authors address various agreements concluded between countries to manage rivers, lakes and basins of groundwater common to several nations, requiring international cooperation and diplomacy that are of particular value to this study. Water diplomacy promotes comprehensive conversations and solutions. Diplomacy is used to bring together stakeholders to create comprehensive water resource management plans. This article employs a descriptive, interpretative, qualitative-quantitative methodology based on the use of primary sources, international and national instruments, as well as the conduct of documentary and bibliographic research. The results obtained allow the authors to conclude that it is impossible to underestimate the importance of water diplomacy for international relations and society. Water diplomacy promotes social justice by putting the needs of all parties first, including historically marginalized groups. Water diplomacy can prevent social inequality in water management and allocation by using inclusive decision-making procedures increasing social equity.

Keywords: Water diplomacy. Environment. Climate change. Bilateral agreements. Ecological deterioration.



#### Resumo

A diplomacia da água é um instrumento fundamental para combater as alterações climáticas, preservar o ambiente e promover o desenvolvimento sustentável. Por esta razão, neste artigo, os autores abordam os vários aspectos da diplomacia da água, incluindo a colaboração internacional, a proteção transfronteiriça da água, o intercâmbio de dados, a proteção ecológica, a gestão das inundações e a segurança alimentar global. Dado que a água ultrapassa fronteiras, os autores abordam vários acordos celebrados entre países para gerir rios, lagos e bacias de águas subterrâneas comuns a várias nações, exigindo cooperação internacional e diplomacia que são de particular valor para este estudo. A diplomacia da água promove conversações e soluções abrangentes. A diplomacia é utilizada para reunir as partes interessadas e criar planos de gestão dos recursos hídricos abrangentes. Este artigo recorre a uma metodologia descritiva, interpretativa, qualitativa-quantitativa, baseada na utilização de fontes primárias, instrumentos internacionais e nacionais, bem como na realização de pesquisa documental e bibliográfica. Os resultados obtidos permitem aos autores concluir que é impossível subestimar a importância da diplomacia da água para as relações internacionais e para a sociedade. A diplomacia da água promove a justiça social ao colocar as necessidades de todas as partes em primeiro lugar, incluindo os grupos historicamente marginalizados. A diplomacia da água pode evitar a desigualdade social na gestão e distribuição da água, utilizando procedimentos de tomada de decisão inclusivos que aumentem a equidade social.

Palavras-chave: Diplomacia da água. Ambiente. Alterações climáticas. Acordos bilaterais. Deterioração ecológica.



## Contents

1. Introduction; 2. Water as a tool to mitigate climate change; 3. Role of water diplomacy in climate change; 4. Role of law, governance, and regulation in water diplomacy; 5. Role of international law in water diplomacy; 6. Impact of water diplomacy and transborder water in South Asia and Southeast Asia; 6.1. Southeast Asia; 6.2. South Asia; 6.2.1. Brahmaputra River Basin; 6.2.2. Ganges Brahmaputra Meghna Basin (GBM); 7. Impact of water diplomacy on the economic sector; 8. Impact of water diplomacy on the environment and sustainable development; 9. Wetland management and delta diplomacy in South Asia; 10. Water diplomacy's impact on the industrial sector; 11. Future Perspective; 12. Conclusion. References.

## 1. Introduction

Water diplomacy has grown in importance as a weapon for developing international and bilateral ties, as well as supporting regional stability and collaboration in the twenty-first century (SEHRING et al., 2022). A potent tool in the fight against climate change is water diplomacy. More than half of the world is suffering from water scarcity, which is harming agriculture and the global food supply. The most pressing threat and impact of climate change on human civilization has emerged. Water diplomacy's ultimate goal is to ensure regional collaboration, stability, and peace. It's not only about limiting water use. Water diplomacy uses water resources to advance the goals of peace and stability through discussions and collaboration (SCHMEIER, 2018). Climate change has become a water crisis for us. As a result, water shortages, forest fires, increasing sea levels, melting ice sheets, and flooding are all getting worse. Water, however, has the ability to combat climate change. To reduce carbon emissions and enhance social and ecological systems, sustainable water management is crucial. Everyone must contribute, both individually and as a household (UNITED NATIONS, 2020).

There is an unbreakable link between water and global warming. Water supplies are becoming either more scarce, more volatile, or more contaminated as a result of the recent extreme weather. These systemic effects put at risk environmental quality, access to clean water, and sustainable development. Climate change is predicted to make already common events like droughts and floods worse. Saltwater intrusion into coastal aquifers may occur when sea levels rise, and harmful compounds may condense as rivers dry out. There are frequent disagreements between nations that are downstream and upstream of the more than 280 shared river basins in the world. Climate change will inevitably lead to conflicts over dwindling water resources in many basins, but this does not always herald the beginning of full-fledged "water wars." Of the almost 2,000 incidents that took place in transboundary basins between 1990 and 2008, about twice as many were cooperative as conflictual. When external circumstances overwhelm institutional coping mechanisms in nations with poor conflict resolution structures, conflict can worsen. There have been seven water wars in history, although none are currently raging between nations.

Water diplomacy is crucial in the fight against climate change through international cooperation in the modern era of escalating climate change and water crises (TOMALOVÁ & ULLRICHOVÁ, 2021). By strengthening transboundary water governance, which in turn can help advance foreign policy objectives, policymakers can gain a foothold in advancing crucial foreign policy interests. As a result, if we can create better cooperation over transboundary rivers, there are bright prospects for resolving political issues and promoting greater regional integration. Transboundary waterways should be seen as a potential entry point for diplomats who hope to gain significant gains from sustaining



peace. To gain these advantages, individuals in charge of foreign affairs should and could do more. Diplomats are frequently in a prime position to support technical cooperation in transboundary basins (DETGES et al., 2017).

## 2. Water as a tool to mitigate climate change

Rainfall patterns are changing as a result of climate change, and this calls for communities and countries to evaluate how they use and manage drinkable water. Potable water is getting harder to find, so this is important. Community health, agricultural production, and the accessibility of renewable energy sources are all impacted by the availability and quality of water. Nearly every Sustainable Development Goal (SDG) is strongly related to water since it powers industry, generates employment opportunities, and influences every facet of development. This is so because wetlands and forests are examples of natural ecosystems that depend heavily on water (THE WORLD BANK, 2023).

Natural places that contain substantial amounts of freshwater include ice, soil and vegetation, aquifers, surface lakes, and wetlands. Rivers and streams are examples of other natural areas. Water can be kept in structures like dams, tanks, retention ponds, agricultural fields, and paddies for use in the future. There are storage options that are both organic and synthetic (sometimes referred to as "green" and "grey" accordingly). For instance, the process of recharging natural subsurface storage can be accelerated greatly with the help of manmade structures.

In addition to producing electricity, hydropower may also serve as a grid stabiliser and a means of energy storage, both of which are essential for the widespread use of other renewable energy sources like solar and wind that have more erratic production. This suggests that increasing water storage through the use of hydropower can assist in lessening the consequences of climate change. A precious resource, water can be exploited to either exacerbate or lessen the consequences of climate change.

Water availability is crucial for hydropower, a sustainable energy source that produces electricity without emitting any greenhouse gases. One strategy to lessen the consequences of global warming is to reduce the need for fossil fuels and increase the usage of hydropower.

Marshes, swamps, and peatlands are examples of wetlands that can absorb carbon dioxide from the atmosphere and store it in the organic material that makes up their ecosystem. Both lowering greenhouse gas concentrations and fending off the effects of climate change can benefit from protecting and restoring these ecosystems (LEPAGE, 2011).

A large amount of the water available in the world is used for agriculture, so conserving irrigation water is crucial. Enhancing irrigation methods, utilising drip irrigation, and additional precision farming approaches aid farmers in conserving water and optimising each drop of water utilised. This results in less strain being placed on the planet's finite water supplies, more efficient food production, and a decrease in greenhouse gas emissions from the use of artificial fertilisers and water pumps.

Water conservation through the use of water-efficient technologies and practises is essential to reducing greenhouse gas emissions and preparing for a changing climate (REVESZ & SARINSKY, 2022). The reduction of greenhouse gas emissions can achieve this. A resource's transportation and purification require less electricity when fewer people use it, which lowers the amount of greenhouse gases released into the atmosphere. Furthermore, water conservation keeps ecosystems healthy overall, even in dry spells and other water shortage situations.

Effective water resource management is one of the most crucial parts of getting ready for the effects of climate change (HOWDEN, 2020). Improved water distribution and storage networks, water-sensitive urban design, and flood prevention systems are a few examples of water-resilient infrastructure components. Communities will be better



equipped to deal with the effects of climate change, such as rising sea levels and extreme weather if they take the necessary preventive measures.

Two examples of water-related disasters that are predicted to increase in frequency and severity due to climate change are floods and droughts. Early warning systems, better floodplain management, and sustainable water management techniques can all help lessen the effects of these kinds of natural disasters and save lives and property.

Because of climate change, desalination and other water treatment methods are becoming more and more important. By taking out salt and other minerals from seawater, the process of desalination purifies water. Freshwater can also be treated with this method. To guarantee water supply in areas experiencing water stress, research and development of more energy-efficient desalination technologies must be funded.

One effective weapon in the fight against global warming may be water. To minimise its potentially harmful effects on the environment and society, it must be carefully managed. Integrated approaches to water resource management are required to meet the goals of sustainable development in the face of climate change. The interconnectedness of the food, energy, and water systems must be considered in these strategies.



Figure 1 – Water as a tool to mitigate climate change

Even while water is thought to be a tool to lessen the consequences of climate change, as Figure 1 illustrates, the increasing issues caused by climate change in many of the transboundary water basins around the world may eventually cause instability and fragility to worsen. Political and economic stability will be necessary for nations to adjust to the effects of global warming and still reach the goals they set for themselves in Paris and the 2030 Agenda. Conflicts over limited water supplies can be avoided and resolved with the use of water diplomacy (CLIMATE DIPLOMACY, 2020).

## 3. Role of water diplomacy in climate change

When it comes to managing shared water resources that are essential to the economies of many countries or regions, water diplomacy has the potential to be a potent weapon in the fight against climate change. Climate change has the potential to change the distribution, quality, and availability of water, which could increase competition for these resources.



To effectively manage the world's water resources, international cooperation is required because many rivers, lakes, and aquifers cross national boundaries. Diplomatic initiatives aimed at improving intergovernmental communication, negotiation, and cooperation are used to manage transboundary water resources (MOYNIHAN, 2021). It supports cooperative decision-making, information sharing, and the creation of just agreements to reduce conflict and guarantee long-term water management. The prevention of conflicts is another benefit of water diplomacy.

The impacts of climate change on water resources can be lessened by the adoption of climate-resilient policies, which can be developed and put into action with the assistance of water diplomacy. Using climate-resilient strategies can lessen these effects (REDGWELL, 2022). Collaborative efforts to pool resources improve people's capacity to recover from and adapt to water-related stresses, such as floods, droughts, and rising sea levels.

When it comes to managing water resources and adjusting to the effects of climate change, sharing best practises is imperative. Using water diplomacy as a platform is precisely what could be achieved. With international forums, agreements, and collaborations, nations can exchange experiences and insights more quickly, enabling them to develop and adapt successful policies.

Preventing and resolving conflicts that arise from competition for scarce water resources is crucial for maintaining harmonious relationships among countries, areas, and societies (FRANCKX et al., 2021). This holds true for both averting these disputes and resolving them. The negotiation of cooperative resolutions to divisive problems and the promotion of communication that results in agreements that benefit all sides equally are given top priority in the water diplomacy process. In order to find fair solutions and guarantee that shared water resources are used in an environmentally responsible manner, mediation and diplomatic efforts can be employed.

Water diplomacy employs an integrated approach that considers the interdependencies of food, energy, water, and ecosystems. It strengthens the case for water management strategies that balance the needs of the water with the demands of a wide range of stakeholders. Water diplomacy cannot succeed unless a wide range of stakeholders are included in decision-making procedures and sustainable development strategies. These stakeholders comprise, among other things, governments, the private sector, civil society, and indigenous communities.

An integrated approach that considers the interdependencies between food, energy, water, and ecosystems is used in water diplomacy. It makes the case for water management strategies that balance the needs for water with the demands of a wide range of stakeholders. Effective water diplomacy requires the involvement of a wide range of stakeholders in decision-making procedures and sustainable development strategies. These stakeholders comprise, among other things, governments, the private sector, civil society, and indigenous communities.

Water diplomacy is based on the sharing of information, including climate, hydrological, and scientific specialised knowledge (VYKHRYST, 2015). Our knowledge of water availability, quality, and unpredictability has improved as a result, opening the door to more fact-based decision-making and the creation of successful climate change adaptation and mitigation plans.

Encouraging parties to collaborate through communication and negotiation to address water-related issues that have been made worse by climate change is known as "water diplomacy." It helps local, regional, and global climate change adaptation and mitigation efforts succeed by promoting better communication, reducing conflict, and improving water management as presented in figure 2. (SWAIN, 2016)





Figure 2 – Role of water diplomacy in climate change mitigation

### 4. Role of law, governance, and regulation in water diplomacy

The management and use of water are also regulated by political, social, and economic institutions in addition to administrative ones. Effective water resource regulation is essential for averting conflicts, maintaining water security, and distributing water resources equitably. Among the many other factors are considerations for the effects on politics, the economy, society, and the environment.

Water governance decisions can have a significant impact on human health as well as the sustainability of water sources in the long run. In the end, having access to water can mean the difference between life and death for many people and help them escape poverty. Thus, the first step in eradicating global poverty must be to improve the management of the world's water resources.

The Sustainable Development Goals cannot be achieved without efficient management of the world's water resources (HUCK, 2021). The general public's health is seriously threatened by inadequate water and sanitation, which also obstructs the continued progress of social and economic life. (SIWI, 2023)

263 international river basins, 300 international aquifers, and other international water sources are shared by 153 countries. More than 40% of the world's population resides in basins that are shared by multiple nations, and over 90% of people live in countries that share basins. 37 major conflicts that directly involved water have occurred since 1948. In the same time frame, 116 river basin organisations were established and 295 international water agreements, including the UNECE Water Convention, were signed. These developments show varying degrees of transboundary cooperation. Cross-border disputes over water use have been exceptionally rare over the past seven decades. (SALMORAL et al., 2019, pp.85-96)

Governance and legislation play a significant role in water diplomacy because they help to facilitate the management of shared water resources, resolve conflicts and promote collaboration between numerous parties (PLATJOUW & POZDNAKOVA, 2023).

Successful water diplomacy requires the establishment of institutional and legal frameworks, which are provided by governance and regulation. Countries that share transboundary water resources are bound by the rights, obligations, and responsibilities outlined in international water agreements, treaties, and conventions. A detailed description of these rights, obligations, and responsibilities is provided. The creation of these frameworks opens the door to discussion, negotiation, and dispute resolution.



Solid institutional frameworks open doors for innovative approaches to climate change adaptation and water management. Regulations can be established by national and regional governments according to their ability to formulate policy. These regulations can control the distribution of water, compliance with quality standards, preservation of the environment, and avoidance of risks associated with water. These regulations help in deciding how to use water while making sure that it is safeguarded for coming generations.

Stakeholder participation and involvement in water diplomacy operations are made possible by governance systems. Everyone has a part to play in this, including academic institutions, private companies, non-governmental organisations, native tribes, and national and local governments. Governance procedures make sure that decisions are equitable for all parties involved by gathering and considering the opinions of multiple stakeholders.

The establishment of the necessary procedures for the gathering, maintenance, and distribution of climate data, hydrological data, and other relevant datasets falls within the purview of governance organisations. Data that is easily obtainable and trustworthy is essential for monitoring water resource changes, making educated decisions, and evaluating the effects of climate change. Information is gathered consistently, shared openly, and utilised to develop evidence-based policy thanks to good governance.

Regulating and governing bodies can help prevent and settle conflicts involving water. To settle disputes over water use, water availability, and water pollution, we must establish legislative frameworks, mediation procedures, and conflict resolution mechanisms (MCINTYRE, 2022). When parties involved in a situation can communicate with each other and work together to find a solution, tensions are lower, and conflicts are more likely to be resolved amicably.

Facilitating capacity development efforts and providing technical assistance through governance structures is facilitated by raising the level of knowledge and potential of stakeholders through technology assistance and capacity development (HEIDAR, 2020). This field of expertise encompasses a wide range of subjects, such as training programmes, best practises for data collection, and strategies for adapting to climate change. Enhancing stakeholder capacities through governance systems boosts the efficacy of water diplomacy.

The regulatory frameworks created by governance include procedures for compliance and enforcement (CABUS, 2021). These frameworks guarantee adherence to agreements, rules, and regulations about water. In order to guarantee that stakeholders are held responsible for the agreements they sign and the actions they take, monitoring and enforcement procedures are crucial. Some results indicate how effective governance systems are, such as building trust between different stakeholders, making it easier for water resources to be distributed fairly, and boosting the effectiveness of water diplomacy (KOTZUR et al., 2018). Water diplomacy encourages parties to collaborate to find solutions to the increased water-related issues brought about by climate change. By promoting dialogue, averting conflicts, and conserving water, it supports local, national, and international efforts to mitigate the effects of climate change and adapt to them.

Overall, governance and law are important in regulating water diplomacy since successful water management necessitates the creation of institutional and legal frameworks, technical assistance programmes, and other elements shown in figure 3.





Figure 3 – Governance and regulation in water diplomacy

## 5. Role of international law in water diplomacy

Because it offers a framework for resolving disputes and managing shared water resources, international law is important to water diplomacy. In order to address transboundary water issues and encourage greater cooperation between countries that have a shared interest in protecting shared water resources, diplomats frequently use diplomatic channels and debates.

The evolution of international law has made it easier for nations to negotiate and ratify agreements and treaties pertaining to the sharing of water resources. The legal foundation that controls how countries use, distribute, and manage their own water resources is established by these international treaties and conventions. The United Nations Convention on the Law of the Non-Navigational Uses of International Watercourses is an example of this (MCCAFFREY, 2019). The purpose of this convention is to establish guidelines and regulations for the non-navigational uses of international waterways. International law establishes norms and principles that govern the behaviour of individual states and apply to the management of shared water resources. Water management that is equitable and sustainable can result from discussions centred on ideas like fair and reasonable use, causing no significant harm, and collaboration. The management of water resources can help achieve these goals. By offering a consistent foundation for decision-making, they aid in the settlement of disputes.

The legal framework governing international relations includes procedures for the peaceful resolution of disputes involving international waterways. Examples of judicial systems are the International Court of Justice (ICJ) and arbitration. This category also includes extrajudicial processes like conciliation, mediation, and negotiation. These processes provide an organised, impartial setting where problems can be discussed and settled in a way that benefits all sides equally.

The encouragement of these endeavours by international law directly results in the proper functioning of diplomatic institutions and water management. Organisations like the International Commission for the Protection of the Danube River (ICPDR), the World Bank (FREESTONE, 2013), and the United Nations (UN) are vital for encouraging cooperation, fostering dialogue, and providing technical support. International law serves as the foundation for these institutions.

Consistent state actions that are recognised by other states give rise to customary international law. Water diplomacy is impacted by this law as well. Customary norms serve as a partial guide for states in managing shared water



resources. These standards stem from well-established ideas like the need to prevent seriously harming riparian countries downstream.

Effective water management requires the development of institutional frameworks, legal frameworks, and technical expertise. All of these components of efficient water management can be formed with the help of capacity development and technical assistance programmes, which are highly recommended by international law. This support not only encourages cooperation but also enables states to fulfil their legal obligations.

If states want to negotiate with one another over shared water supplies, they can look to international law for a set of rules, guidelines, and enforcement procedures to abide by. It facilitates water diplomacy and aids in the sustainable management of transboundary water institutions while also increasing transparency, fostering cooperation, and aiding in the problem-solving process.

International water law (IWL) principles are frequently used to mediate disputes or conflicts between states along a waterway. This encourages the states to cooperate in order to find a solution that benefits both their water supplies and the stability of the region as a whole. The concepts of IWL are applicable to the adjudication or enforcement of law as well as to international relations and diplomacy. IWL principles can also present an inherent dilemma in the context of negotiations or other extrajudicial interactions between riparian states due to their ex-ante role. This is because they can function as both the framework and the focal point of negotiations, with both functions having an impact on the outcome of the negotiations and the possibility of negotiated compromises. (SCHMEIER, 2021)

## 6. Impact of water diplomacy and transborder water in South Asia and Southeast Asia

#### 6.1. Southeast Asia

Because shared river basins and complex hydrological geography characterise Southeast Asia, water diplomacy and transboundary water resources management are crucial. Important rivers like the Mekong, Irrawaddy, Salween, and Chao Phraya offer opportunities and challenges for water diplomacy because they pass through several nations. The Yangtze and Mekong are two other noteworthy rivers.

The objective of the cross-border cooperation initiative, which is a component of water diplomacy in this region, is to increase cooperation amongst Southeast Asian countries that rely on one another for cross-border water supplies. To achieve these goals of equitable and sustainable water use, it is essential to have conversations, negotiate, and make agreements. In order to address several issues, such as flood control, the development of hydropower, water distribution, and environmental preservation, the Mekong River Commission (MRC) was founded.

Starting in China, the Mekong River flows through Myanmar, Laos, Thailand, Cambodia, and Vietnam before emptying into the South China Sea. Millions of people depend on the Mekong River for their daily survival, so efforts to mitigate the negative effects of dam construction, regulate water flow, and guarantee the sustainable management of fisheries resources are all part of this region's water diplomacy. Collaboration, data sharing, and Mekong River decision-making all depend on the Mekong River Commission.

The management of water across international borders may be impacted by the recent surge in hydropower production in Southeast Asia in both positive and negative ways. It is necessary to assess and deal with the possible negative effects of hydropower projects on countries downstream, such as changed water flow patterns, sedimentation,



and biological changes. One aspect of this process is water diplomacy. In order to meet our energy needs and advance other important societal, economic, and ecological objectives, we must work together as a community to find a solution.

Due to the effects of climate change, the management of water resources in Southeast Asia has directly resulted in the emergence of new issues that call for environmental adaptation. External factors like an increase in the frequency of extreme weather events and changes in the pattern of rainfall have an impact on the amount, quality, and distribution of water that is available. The creation of integrated water management policies, the sharing of information about climate change, and the planning of adaptation plans are the main objectives of water diplomacy in the area.

Southeast Asian water diplomacy places an emphasis on integrated water resources management (IWRM) techniques due to the interdependence of water, energy, food, and ecosystems. This is a result of these four factors' interdependence. Through the involvement of multiple sectors, stakeholders, and levels of governance, this comprehensive strategy aims to increase the amount of water that can be allocated, the amount of water that can be used efficiently, and the overall health of ecosystems.

Hydrological data, climate data, and scientific knowledge must all be freely shared and exchanged for water diplomacy to succeed. International and institutional organisations must focus their efforts if we are to improve platform sharing, data collection, and technical cooperation. This broadens our understanding of water resources across national boundaries and opens the door for more evidence-based decision-making.

The Sustainable Development Goals (SDGs), particularly Goal 6 on the provision of clean water and sanitation and Goal 13 on the mitigation and adaptation to the effects of climate change, are aligned with the pursuit of water diplomacy in Southeast Asia. Water diplomacy can help achieve these global development goals by promoting collaboration, ecologically conscious water management, and climate change adaptation.

In Southeast Asian affairs, water diplomacy plays a critical role, especially about the development of hydropower, climate change, and the advancement of just and sustainable water management techniques. Successful water diplomacy and the long-term sustainability of the region's shared water resources depend on cooperative efforts.

#### 6.2. South Asia

The effective handling of water-related problems in South Asia requires both transboundary water management and water diplomacy. Because transboundary river basins and water resources are present in the region, cooperation and good governance are essential to achieving water justice and guaranteeing the region's long-term water security. Transboundary water management and water diplomacy in South Asia should take into account the following factors.

Several enormous river basins that are shared by multiple countries can be found in the region known as South Asia. These kinds of watersheds include the Mahakali, the Indus, and the Ganges-Brahmaputra-Meghna (GBM) basins. Water diplomacy, which seeks solutions to problems like water distribution and flow regulation, hydropower production, flood management, and environmental conservation, faces unique challenges when sharing river basins.

Negotiating and carrying out water-sharing agreements among riparian countries is one of the most significant facets of water diplomacy in South Asia. Key agreements that specify water allocations, dispute resolution procedures, and cooperation frameworks are the Ganges Water Sharing Treaty between India and Bangladesh and the Indus Waters Treaty between India and Pakistan. In 1960, these two treaties were ratified.

The unrestricted flow of hydrological data, climate data, and scientific knowledge across countries is necessary for effective transboundary water management. Sharing data and information between nations is one of the primary



goals of water diplomacy, and it has the potential to improve a variety of water-related activities, including evidencebased decision-making, flood forecasting, drought management, and the evaluation of water supply and quality.

The cooperative efforts of regional and international organisations are crucial to South Asia's water diplomacy and the management of transboundary water sources. A few examples of forums that promote coordination, communication, and cooperation amongst riparian governments are the Ganges-Brahmaputra-Meghna Basin Organisation (GBMBO), the Indus River System Authority (IRSA), and the South Asian Association for Regional Collaboration (SAARC).

South Asia's water supply is seriously threatened by melting glaciers, altered rainfall patterns, and a rise in the frequency of extreme weather events. As a result, the region must adjust to climate change. Government cooperation on the creation of climate-resilient water management policies, the promotion of effective adaptation strategies, and the bolstering of flood and drought early warning systems is encouraged by the employment of water diplomacy. Enhancing early warning systems is one way to achieve these objectives.

When it comes to disputes involving transboundary water resources, waterfront diplomacy is essential for averting conflict as well as for settling it. This is due to the fact that waterfront diplomacy emphasises water. Water diplomacy is the process of addressing conflicting water needs, settling disagreements, and averting tensions that might arise from hydropower development, water shortages, or other water-related issues. By encouraging dialogue, cooperation, and negotiation among riparian nations, this is achieved.

Stakeholder participation: A wide range of stakeholders, including governments, local communities, organisations that represent civil society and researchers, as well as the private sector, should be involved in water diplomacy. Improved transparency, inclusivity, and consideration of different viewpoints are more advantageous when these parties are involved in the transboundary water management decision-making process.

Enhanced expertise in transboundary water management through technical assistance and capacity building: Students will learn about a range of topics in these classes, such as data collection and analysis, water governance, conflict resolution, and climate change adaptation.

The Ganges-Brahmaputra-Meghna (GBM) Basin's convergence point, where these three major rivers converge and receive their individual tributaries, has become a major area of concern for South Asia's water security. The current water supply is under tremendous strain due to the countries that share these rivers' increasing demand for water resources, which is made worse by the countries expanding economies and swift population growth. Furthermore, the unpredictable precipitation patterns and rising frequency of natural disasters linked to climate change have made it more difficult to manage these waterways responsibly, especially when it comes to international borders.

In the past, bilateral or trilateral agreements to address these issues have been preferred by Beijing and New Delhi. However these strategies have frequently been shown to be ineffective, and China's and India's unilateral actions have often made tensions worse. It is noteworthy that there have already been seven water-related conflicts reported worldwide (VISHWANATH, 2018).

In summary, transboundary water management and water diplomacy, which greatly influence the relationships between the nations that share basins and prevent water-related conflict, are essential for effectively addressing water-related issues in South Asia. Figure 4 illustrates the multiple roles of water diplomacy, including flood control and environmental preservation.

Water diplomacy: an important tool for climate change mitigation and sustainable development





Figure 4 - Role of water diplomacy in South Asia

#### 6.2.1. Brahmaputra River Basin

About 100 million people are living in the Brahmaputra basin, and the great majority of them are employed in agriculture. Since most locals depend on riverbank agriculture, cattle, forestry, fisheries, textile, handloom, and garment factories for their daily bread, water is essential to the region's economy. The river provides the only access to clean drinking water for a large number of the basin's inhabitants, many of whom are extremely poor. Nonetheless, there is a great deal of unrealized potential for the Brahmaputra River basin (BRB) to reduce poverty. Among the many uses of the river are opportunities for hydropower development and inland water traffic (BARUA, 2018, pp.60-70). The four nations that share this basin are China (50.5% share), India (33.6%), Bangladesh (8.1%), and Bhutan (7.5%). Despite being a vital component of South Asia and possessing significant economic potential, not much has been attempted to manage this transboundary river at the regional level.

One of the regions in South Asia most likely to experience interstate water conflict is the Brahmaputra basin. There is little chance of a war for water, even though China and India have engaged in bloody combat inside the borders of the Brahmaputra basin. This is because, contrary to popular belief, China's contribution to the Brahmaputra's flow is less than that of other countries, and the river's enormous volume is of little use in resolving India's grave concerns about water security. The Brahmaputra is and will continue to be essential to Sino-Indian relations in several ways, including the investment of water infrastructure to control and demarcate territory. (GIORDANO & WAHAL, 2022) No river on Earth seems as volatile as the Brahmaputra. Among the four nations that share the river are the two most populous in the world, China and India. Even though their economies are growing quickly, both are suffering from acute water shortages. Cooperative management of the Brahmaputra faces greater challenges as the monsoon season changes and glaciers melt because there are no formal water-sharing agreements, there is a lack of historical exchange of even basic hydrologic data, and diplomatic relations are strained. Moreover, China has shown no enthusiasm for cooperative transboundary water management in the Brahmaputra or anywhere else. China, the upstream state, is



building infrastructure, particularly dams, to manage water in the Brahmaputra basin without first consulting its downstream neighbours.

South Asia's Brahmaputra River basin is a major international waterway that passes through Bangladesh, India, and China. Therefore, effective water diplomacy is necessary to ensure the fair and sustainable use of the Brahmaputra's water resources. In the Brahmaputra River basin, water diplomacy places a strong emphasis on cross-border collaboration between Bangladesh, India, and China - the three riparian nations. Water availability, flood control, sedimentation, and navigation are among the issues where communities can cooperate to find solutions.

In order to manage water resources in the Brahmaputra River basin effectively, precise hydrological data and information must be easily accessible. Riparian countries can more effectively exchange data about precipitation patterns, river flow measurements, and sedimentation rates by engaging in water diplomacy. Transparency in data sharing facilitates fact-based decision-making, enhances understanding, and facilitates the deployment of early warning systems for flood control.

The Brahmaputra River basin has a lot of potential for producing hydropower, but putting such projects into action could have unexpected effects on the river's downstream flows and ecosystems. Water diplomacy addresses issues concerning sedimentation, flow control, and the ecological effects of hydropower generation. A compromise between energy production and consumption, downstream water demands, and environmental impact is the goal of the collaboration.

Changes in rainfall patterns, glacial melt, and an increase in the frequency of extreme weather events are some of the effects of climate change that pose a threat to water security in the Brahmaputra River basin. In water diplomacy, adaptation and resilience against climate change are emphasised through collaboratively developing solutions for flood control, water storage, and addressing the consequences of shifting hydrological conditions.

Ecosystem preservation and biodiversity conservation are given top priority in the Brahmaputra River basin through water diplomacy. The main targets of conservation and restoration efforts are riparian habitats such as floodplains and wetlands. Preserving natural habitats contributes to stable fish populations, clean water, and increased resilience of the basin against climate change.

An essential shipping and transit route in the area is the Brahmaputra River. Resolving disputes over navigation rights, ensuring safe passage, and offering sufficient depths for navigation are a few issues that fall under the umbrella of "water diplomacy." Riparian nations can interact with one another through cooperative methods to optimise the economic and environmental advantages of the river's use.

The importance of including a diverse variety of stakeholders, including communities, CSOs, national and local governments, and indigenous peoples, is recognised by water diplomacy. By guaranteeing that a diverse range of interests and points of view are taken into consideration during the decision-making process, stakeholder engagement supports inclusive and long-term water management practises.

Faced with competing water users and interests, the goal of diplomacy around the water resources of the Brahmaputra River Basin is to avoid and resolve conflicts. Aiming to find solutions that are advantageous to all parties concerned, water diplomacy seeks to accomplish peaceful transboundary water management via the encouragement of collaboration, communication, and negotiation.



#### 6.2.2. Ganges Brahmaputra Meghna Basin (GBM)

The need to supply sufficient food supplies, the growing population, and the high rates of poverty have all led to the politicisation of water. Despite the constant fluctuations in water demands and availability, South Asian countries have remarkably few efforts aimed at collaborating at the basin level. The region's attempts to promote economic growth and urbanisation, along with irrigation—the main water user—highly augment the overall water needs. The most significant water sources for South Asia historically have been the Himalayan rivers, the Brahmaputra, Ganges, and Indus. The Himalayan snow and ice melt provides a significant boost to several of these rivers. The Himalayan area is sometimes referred to as Earth's third pole since it has greater ice accumulation than either the North or South Poles.

Conflicts emerge when several countries, regions or even private landowners assert their ownership of the same body of water that flows through the Himalayas (Bandyopadhyay, 2014). Bangladesh, India, Nepal, and Bhutan share the 1.7 million square kilometre Ganges Brahmaputra Meghna (GBM) Basin, which is depicted below in figure 5. This river basin is one of the most populated in the world, home to around 500 million people. The basin's numerous challenges lead to inadequate management of its water resources. Frequent floods and droughts have severe negative effects on the environment, society, and economy (WORLD METEOROLOGICAL ORGANISATION, 2021). The GBM basin's riparian nations have challenges with water allocation and sharing. Countries downstream, like India and Bangladesh, may be impacted by the water management strategies of upstream countries, like China and Nepal. Through diplomatic contact, discussion, and cooperation among these nations, equitable and sustainable water-sharing processes may be established, taking into account the interests of all riparian states.

In the GBM basin, flood damage to agriculture, infrastructure, and people's livelihoods is a severe issue that has to be addressed by flood management initiatives. For effective flood management, cross-border collaboration is required. Countries in the basin may collaborate to develop flood prediction models, early warning systems, and coordinated response strategies by using water diplomacy. It may facilitate conversations on flood preparedness between individuals.

Because of their biological importance, wetlands, mangroves, and other habitats in the Great Barrier Reef basin need to be protected. These areas support several ecological services and a wide variety of species. Riparian nations may cooperate to save and sustainably manage their river systems by engaging in water diplomacy. This might be advantageous for transboundary protected area networks, cooperative conservation strategies, and habitat restoration initiatives.

The GBM basin must adjust to the consequences of climate change, which include increased frequency and intensity of extreme weather events, rising sea levels, and altered rainfall patterns. Water diplomacy is the only way to accomplish the collective action needed to adapt to climate change. It can facilitate the sharing of knowledge, resources, and technology among riparian nations, strengthening the basin's resilience to climate change.

The rivers in the GBM basin are essential for interior travel and navigation. Enhancing these mechanisms is therefore crucial. Building ports, navigation routes, and other infrastructure requires international coordination to optimise economic benefits, avoid environmental harm, and assure sustainable growth. Water diplomacy may be used to negotiate cooperative infrastructure projects, regulatory frameworks, and safe and effective navigation across the basin.

In the GBM basin, untreated sewage, industrial and agricultural runoff are among the major causes of water pollution that need to be addressed. To address shared pollution sources, international collaboration is required for both pollution prevention and water quality management. International collaboration made possible by water diplomacy can assist in lessening the consequences of pollution on ecosystems and human health. In the Ganges



Brahmaputra Meghna (GBM) basin, water diplomacy is crucial for issues including water sharing, flood control, ecological protection, climate change adaptation, navigation, infrastructure development, and pollution control. Water diplomacy may support the development of sustainable and integrated water management practises among riparian nations, ensuring the fair and effective use of water resources while preserving the environment and assisting the populations reliant on the GBM basin.



Figure 5 – Ganges Brahmaputra Meghna Basin rainfall (Source: Jayanta Bandyopadhyay, 2014)

#### 7. Impact of water diplomacy on the economic sector

The realm of economics is significantly affected by water diplomacy. Diplomatic activities are mostly responsible for allocating water resources and granting access to these resources for a range of economic sectors. The process of ensuring that water is distributed effectively to support economic activities like agriculture, industry, energy production, and domestic consumption is known as "water diplomacy" and is accomplished through agreements and dialogues (TEZER & BODUR, 2020). This is done to guarantee that water can be used effectively to support economic endeavours such as household consumption, industry, and agriculture.

Agriculture is a vital economic sector that uses a lot of water, therefore productivity there is crucial. Building irrigation infrastructure, implementing efficient water management techniques, and negotiating agreements about water sharing are just a few of the situations in which water diplomacy may be useful. Food security and agricultural production both enhance as a result of water diplomacy's facilitation of cooperation and settlement of water-related conflicts.

Water is essential for the growth of industry since it is used in so many various phases of the production process, including in cooling and cleaning procedures. By taking into account the demands of other sectors and making sure that they are taken into consideration, water diplomacy guarantees that the industrial sector's water needs will be addressed sustainably and fairly. De-escalating conflicts and resolving water-related problems are two ways that water diplomacy advances industry and the economy.

Hydropower is a renewable energy source that requires the usage of water. Hydropower projects need proper management of transboundary water resources, which requires a high degree of diplomatic skill. Water diplomacy helps to make sustainable use of hydroelectric resources feasible by resolving problems with dam building, river flow control,



and downstream repercussions. This contributes to energy security and economic prosperity. Water diplomacy makes hydroelectric resources usable. Waterways, such as rivers, lakes, and canals, are important for commerce and transportation, thus managing them wisely is a crucial aspect of international water diplomacy. Water diplomacy ensures navigability, settles conflicts, and promotes cooperation between riparian nations to let goods travel through effectively and economically, hence promoting global commerce and economic integration. Additionally, the integration of the global economy is aided by water diplomacy.

In addition to other natural water features, rivers, lakes, and coastlines are often visited by tourists (HAN, 2021). Waterfalls are among the other natural water features. When water diplomacy is implemented, clean water sources become more readily available, which improves the tourism industry. The development of sustainable water management techniques and the settlement of conflicts are two ways that water diplomacy helps the tourist sector. Consequently, this leads to financial gains through heightened tourism expenditures and the generation of fresh employment prospects.

Water diplomacy affects projects like irrigation systems, wastewater management facilities, water treatment plants, dams, and other related initiatives. In order to guarantee that infrastructure expense is in accordance with both economic concerns and sustainable water management goals, water diplomacy offers a forum for dialogue and cooperation. These features encourage investment in water infrastructure. It calms investors, lessens the chance of unfavourable things happening, and opens the door for long-term planning and economic growth (AKINKUGBE & MAJEKOLAGBEE, 2023).

Warfare over water resources is less likely when water diplomacy is used effectively. Water diplomacy also helps to maintain an atmosphere that is conducive to economic development by encouraging dialogue, collaboration, and the peaceful resolution of water-related conflicts. Figure 6 illustrates how water diplomacy affects the economy overall by promoting equitable water distribution, accelerating the growth of industry and agriculture, assisting in the creation of renewable energy, facilitating trade and shipping, promoting tourism, directing infrastructure investment, and fostering economic stability. The reason for these impacts is that water diplomacy promotes economic stability and directs investment in infrastructure and tourism. Water diplomacy helps build collaborative efforts and solve water-related issues in order to assist in establishing the groundwork for long-term economic growth and development.



Figure 6 - Impact of water diplomacy on the economic sector



# 8. Impact of water diplomacy on the environment and sustainable development

Waters that flow over international borders account for 60% of the freshwater resources on Earth. Together with 286 transboundary river and lake basins, there are 592 transboundary aquifer systems. There are at least 153 distinct nations represented in these basins. The great majority of nations are unable to collaborate effectively across borders. The majority of countries lack operational agreements that cover the entirety of the regions that comprise their transboundary basins. The provision of ecosystem services across international borders is threatened by practises including overfishing (MOLENAAR, 2020) and water source pollution. If a country decides to build a dam without first taking into account the nations that are downstream, it may experience serious consequences. Resources at the shore may be endangered by activities higher upstream. When aquifers are depleted, seawater may flow inland from the beach, increasing the concentration of harmful elements like fluoride and arsenic. (UNITED NATIONS, 2021)

Sustained economic growth and the sustainability of our planet both depend on the efficient use of water resources. Water habitats, including rivers, marshes, and beaches, to mention a few, greatly benefit from the efforts made by water diplomacy to preserve and manage these natural resources responsibly. To stop ecosystem degradation, maintain biodiversity, and safeguard the ecological integrity of water supplies, water diplomacy aims to persuade countries to communicate and cooperate. This helps maintain healthy populations of fish and animals as well as the products and services that natural ecosystems provide, such as regulating flooding, purifying water, and producing goods and services.

One crucial component of the process of adapting to the effects of climate change on the world's water supply is water diplomacy (NOORDA, 2022). Water diplomacy promotes the creation and use of plans that can assist communities in adjusting to the consequences of climate change via collaborative efforts. Incorporating climate data into decision-making processes, increasing water storage capacity, improving water efficiency, implementing flood and drought control strategies, and many more initiatives are examples of such projects. Water diplomacy can assist ensure continuing sustainable development even as Earth's climate changes.

Persuading nations to manage their water resources in a way that is less detrimental to the environment is the aim of water diplomacy (MURPHY, 2022). These include the preservation of water quality, the management of water resources, and water conservation. "Water diplomacy" is the process of identifying and putting into place sustainable water management systems that balance the needs of different sectors and safeguard the long-term availability and quality of water resources by encouraging collaboration, communication, and the sharing of best practises.

Ending the practise of dumping pollutants created by industrial and agricultural operations into international rivers is one of the main objectives of water diplomacy. Water diplomacy, which depends on collaborative efforts and international agreements between states, aims to reduce pollution, improve rule compliance, and build effective monitoring systems. The preservation of the water's purity lowers the possibility of harm to aquatic ecosystems and public health.

Water diplomacy is a practise that promotes integrated development planning (LANGLET & RAYFUSE, 2018). This is significant because it considers the interdependence of ecosystems, water systems, and economic growth. To make it easier for water management issues to be included in a wide range of development disciplines, the practise of water diplomacy promotes collaboration across several sectors and stakeholders. These sectors include infrastructure development, energy generation, agriculture, and urban planning. This all-encompassing approach promotes growth that aligns with the needs of the present and the future, therefore contributing to its success.



Stakeholders that ought to be included in water diplomacy activities include the commercial sector, civil society organisations, indigenous groups, and local communities (RODRIGUES, 2017). These stakeholders' expertise, worries, and points of view are taken into account when they are included in the decision-making process. Adopting a more participatory approach directly results in the empowerment of local people and highlights their contributions to environmental conservation.

A method called "water diplomacy" helps to settle disagreements peacefully over how to divide up common water resources. Water diplomacy helps avoid and resolve conflicts that emerge over water distribution, infrastructure development, and environmental repercussions by providing a forum for these matters to be discussed. Conflicts that might be harmful to the environment and sustainable development are less likely when riparian nations work together and communicate with one another via the use of water diplomacy. This is so because the goal of water diplomacy is to promote mutual understanding and cooperation between riparian nations.

Water diplomacy can support sustainable development and environmental conservation in a variety of ways, such as through promoting stakeholder engagement, integrated development planning, ecosystem conservation, climate change adaptation, sustainable water management, the avoidance of transboundary pollution and many more as stated in figure 7. The objective of water diplomacy is to resolve water-related conflicts cooperatively and inclusively, which benefits economies, people, and ecosystems. Thus, the promotion of a resilient and sustainable future is aided by water diplomacy.



Figure 7 – Impact of water diplomacy on environment

## 9. Wetland management and delta diplomacy in South Asia

The term "water diplomacy" encompasses a broad range of strategies, some of which are especially pertinent to South Asia's cooperative management of wetlands and deltas.

Bangladesh and India share the Sundarbans mangrove forest in South Asia, which is the site of diplomacy in the region's wetlands. A section of the Rann of Kutch is located on each of the continents of India and Pakistan. To foster cooperation and cooperative management to safeguard and responsibly utilise these interdependent wetland habitats, the riparian nations in the area are aggressively pursuing diplomatic measures. The goal of this action is to preserve these ecosystems.

The international agreement known as the Ramsar Convention on Wetlands was formed to safeguard wetland ecosystems for the foreseeable future (GARDNER & DAVIDSON, 2011). In 1971, this convention was established. India,



Pakistan, Bangladesh, Nepal, and Sri Lanka are among the South Asian nations that have consented to be parties to this pact. The South Asian countries use "wetland diplomacy" to achieve their commitments under the Ramsar Convention and disseminate the best practises for managing wetlands.

The mainstay of diplomacy concerning South Asian wetlands is regional cooperation, which is nourished by regional initiatives. Organisations like the South Asian Association for Regional Cooperation (SAARC) have started programmes like the SAARC Regional Study on Biodiversity and the Environment because they have concerns about the challenges involved in managing wetlands. To solve the complex issues of wetland conservation and sustainable usage, these projects promote cooperation, communication, and knowledge sharing.

In South Asia, several river deltas are shared by multiple nations, such as the Ganges-Brahmaputra-Meghna Delta (shared by Bangladesh and India) and the Indus Delta (shared by Pakistan and India). Deltas are now at the centre of delta diplomacy due to their significance for human livelihoods, agriculture, and biodiversity.

In a river delta, riparian nations frequently struggle with allocating the river's water resources. The core of delta diplomacy's approach to these issues is the use of communication, negotiation, and cooperative processes. The discussion includes topics including equitable water distribution, flood control, and sustainable water use.

Organisations within river basins are the primary source of support for delta diplomacy in South Asia. The Indus River System Authority (IRSA) is in charge of managing and distributing water in the shared Indus River basin between Pakistan and India. The Ganges-Brahmaputra-Meghna River Commission oversees coordinating water management initiatives between Bangladesh and India in their shared delta region (GBMRC).

Part of delta diplomacy involves addressing the effects of climate change on river deltas in South Asia. Rising sea levels, increased salt intrusion, and extreme weather events seriously threaten the resilience and sustainable development of these deltaic ecosystems. Through the implementation of adaption strategies, the dissemination of scientific information, and the mobilisation of global support, delta diplomacy is a type of international collaboration that seeks to increase the resilience of delta regions to the consequences of climate change.

Despite their ecological vulnerability, deltas have historically been centres of economic expansion. The interdependencies between river, coastal, and marine processes and the role that ecosystems play in preserving these interdependencies must be understood to manage these landscapes in an integrated manner.

Our understanding of the value of ecosystems and the methods for preserving them is founded on an examination of the ecological and hydrological processes that occur throughout the delta. It is imperative that national and international landscape planning and investment decisions incorporate data on regional hazards and mitigation solutions. (WETLANDS INTERNATIONAL, [s.d])

At least one or two people leave their homes in the Ganges-Brahmaputra delta's Sundarbans Forest every day. This event is but a glimpse of the larger tragedy that is taking place in South Asia's delta regions, where millions of people are at risk of natural disasters like floods and storms as a result of the land gradually sinking owing to rising sea waves. The confluence of the Ganges and Brahmaputra rivers forms the largest delta in the world in Bangladesh, which is dotted with 139 polders at the delta's mouth. To keep the water out, an embankment is constructed around each polder. Every year, embankments get taller due to constant breaking and patching. (NARAYANAN, 2014)

In conclusion, wetland management is crucial to water diplomacy since many countries share the same deltas and wetland regions. Its significance relies on preventing flooding, safeguarding ecosystems and communities that are at risk, promoting biodiversity, and reducing global warming, as seen in figure 8.





Figure 8 – Wetland management and its importance in water diplomacy

### 10. Water diplomacy's impact on the industrial sector

Resolving disputes arising from different sectors' use of water, especially the industrial sector, might be aided by water diplomacy. Water diplomacy can ensure that industrial sectors receive their fair share of water resources while also taking into account the needs of other sectors and the environment by fostering conversation and debate that will lead to the development of equitable and sustainable water allocation systems.

Resolving water-related issues that emerge between businesses and communities can both obstruct and slow down development. The disputing parties can talk about the issue, decide how to resolve it, and take action to either eliminate the possibility of water-related disruptions to industrial operations or, if they do occur, lessen the degree of the disruptions. All of this is made feasible by water diplomacy.

Practises for managing water that is both economically and environmentally sound are promoted through the use of water diplomacy. Water diplomacy can assist in promoting the adoption of water-saving technology, water recycling and reuse practises, and water conservation measures in industrial processes by fostering collaboration and the exchange of knowledge. Water conservation and waste reduction can help achieve this. Adoption of these practises has the potential to make industrial operations more resilient, water-efficient, and sustainable.

Water diplomacy is a practise that can be used to encourage the creation of policies and regulatory frameworks in the industrial sector that support the long-term sustainability of water supplies and foster justice and transparency. "Water diplomacy" refers to the sharing of ideas and the drafting of new laws and regulations to promote water conservation, pollution prevention, and the ethical use of water in business.

Partnerships between the public and corporate sectors and non-governmental organisations (NGOs) are not unusual in the subject of water diplomacy. The development of novel water technologies, environmentally friendly industrial water management techniques, and water infrastructure are just a few of the areas that can benefit from these kinds of cooperative efforts (MCCAFFREY et al., 2017). Public-private partnerships are the engine driving



sustainable industrial development, and water diplomacy is the key that unlocks the door to responsible water management. These two elements combined make up water diplomacy.

Including a broad spectrum of interested parties in inclusive decision-making processes, such as business and industry leaders, local residents in affected areas, and environmental advocacy groups, is another important aspect of water diplomacy. When the industrial sector is involved in conversations about water management, one could take into account the specific needs, worries, and capabilities of the industry. It is anticipated that more ecologically friendly, comprehensive, and advantageous to industry and society at large water management practises will emerge from an inclusive strategy that promotes understanding and trust.

## **11. Future Perspective**

Water diplomacy has the potential to reduce the possibility of transboundary conflicts, advance sustainable development, and mitigate the effects of climate change (KORNFELD, 2019). Effective international cooperation on climate change adaptation and mitigation can be achieved by diplomatically addressing water-related challenges. This entails cutting back on the quantity of greenhouse gas emissions generated by hydroelectric and sewage treatment facilities. An extra degree of backing is given to initiatives that seek to mitigate the consequences of climate change through the use of water diplomacy. These programmes include drought and flood early warning systems, water storage and conservation techniques, and sustainable water management practises.

Water-related diplomatic initiatives often place high importance on integrated water resource management (IWRM) techniques. IWRM (Integrated Water Resource Management) considers the ecological, social, and economic contexts of water resources. Water diplomacy lessens the strain on water supplies and ecosystems by promoting the integration of water management issues into other industries, such as agriculture, energy, and urban planning. These methods reduce the pressure on ecosystems and water supplies.

Countries can exchange best practises, lessons learned from one another's experiences, and scientific knowledge through water diplomacy. Through knowledge sharing, we can find creative solutions for managing water resources that are both effective and considerate of the environment. By examining successful case studies from the past and cooperating on research, nations may implement effective policies for preventing climate change, adjusting to its effects, and promoting sustainable development.

Preventing and resolving disputes over the allocation of global water resources is the most important function that water diplomacy can fulfil. Water diplomacy helps riparian states strike a balance between their competing water demands and national interests by fostering dialogue, fostering cooperation, and establishing cooperative frameworks. Water diplomacy can help to promote peaceful coexistence and prevent potential confrontations. Collaborative water management and the settlement of water disputes are how this is achieved.

Given the importance of inclusivity in water diplomacy, participation from a wide range of stakeholders is highly encouraged, including governments, business companies, civil society organisations, and local people. The quality of decision-making is enhanced when participation from all pertinent stakeholders enables the consideration of a wider range of viewpoints and interests. Water diplomacy aims to promote water management strategies that are environmentally sound and socially just by involving pertinent parties. These behaviours support the fight against and adaptation to the effects of climate change.

Water diplomacy can be used to support a variety of sustainable water infrastructure projects, including irrigation systems, dams, and water treatment facilities. Through increasing the use of renewable energy sources and



decreasing the amount of water waste that is created, these infrastructure projects have the potential to aid in the fight against climate change. Water diplomacy, which considers social and environmental issues, can assist in developing and implementing infrastructure projects that lessen adverse effects and encourage sustainable growth.

Water diplomacy includes, among other things, encouraging capacity development efforts and technical assistance programmes to assist countries in strengthening their knowledge, skills, and capabilities related to water management. Governments combating climate change, promoting sustainable development, and managing transboundary water resources are helped by water diplomacy through training, experience sharing, and funding cooperative research projects.

Teaching locals how to save water is crucial, especially for farmers and those who live near the ocean. To accomplish this, we must collaborate with global corporations to create new policies, fortify links between rural and urban areas, and provide training to individuals at the grassroots level so they may be put into practise. A shortage of water is a problem for many nations in the twenty-first century, preventing them from producing enough food, and energy, or meeting their fundamental requirements (STĂNILĂ & STĂNILĂ, 2021). The objectives of water diplomacy include the maintenance of peace along international waterways, the advancement of environmental sustainability, and the mitigation of climate change.

## 12. Conclusion

It is impossible to overestimate the significance of water diplomacy to international relations and society. Water diplomacy advances social justice by putting the needs of all parties—including historically marginalised groups—first. Water diplomacy can prevent social inequality in water management and allocation by utilising inclusive decision-making procedures. This improves interpersonal relationships, lessens conflict, and increases social equity. One method by which water diplomacy raises living standards is by promoting sustainable water management techniques. Diplomatic cooperation on the water issue can boost the availability of water for businesses that depend on it for their livelihoods, such as agriculture and fisheries. Water diplomacy can lead to greater opportunities for understanding and cooperation between nations, which can improve social and economic situations.

An important component of disaster diplomacy is lowering the chance of catastrophic disasters, like floods or droughts. Water diplomacy, which encourages cooperation and information sharing between nations, supports early warning systems, emergency response coordination, and the construction of infrastructure to mitigate the effects of water-related disasters. This lessens human suffering, strengthens society's capacity to recover from calamities, and promotes long-term development in dangerous areas.

Countries can learn about one another's customs and cultures by using water diplomacy. Water diplomacy enables the discussion and cooperation of concepts, practises, and moral principles related to water management. Promoting receptivity to new ideas and a willingness to uphold cultural traditions, improves bilateral ties and enhances cultural diplomacy. Developing better relations between countries that share transboundary water resources is largely dependent on water diplomacy. The framework of communication, negotiation, and collaboration in water diplomacy leads to the development of trust, promotion of cooperation, and facilitation of joint decision-making. As a result, relations between riparian nations strengthen, hostilities lessen, and peace and stability rise.

Water diplomacy facilitates economic cooperation between nations by promoting joint investments in water infrastructure, such as irrigation systems, hydropower projects, and dams. Trade, economic expansion, and regional



cohesiveness can all be enhanced by international cooperation in the management of their common water resources. As a result, sustainable development is promoted and economic relations between the two nations are reinforced.

Nations that work together can address problems like water pollution, biodiversity preservation, and the defence of delicate aquatic habitats. By demonstrating a shared commitment to environmental sustainability, water diplomacy strengthens bilateral relations and fosters a sense of shared environmental responsibility.

Lastly, another important aspect of water diplomacy is preventing and settling conflicts that result from competition for limited water resources. By encouraging dialogue, compromise, and the development of cooperative processes, water diplomacy helps to manage competing water demands and find peaceful solutions to issues. This promotes cooperation on issues other than water supply, lowers the possibility of war, and maintains friendly relations between the two nations.

## References

AKINKUGBE, O. D.; MAJEKOLAGBE, A. International investment law and climate justice: the search for a just green investment order. Fordham International Law Journal, v. 46, n. 2, p. 169-211, 2023.

BANDYOPADHYAY, J. The case for water diplomacy for South Asia (Ganges-Brahmaputra-Meghna Basin). **Water Diplomacy**, 25 march 2014. Available at: <u>https://blog.waterdiplomacy.org/2014/03/the-case-for-water-diplomacy-for-south-asia-ganges-brahmaputra-meghna-basin/</u>.

BARUA, A. Water diplomacy as an approach to regional cooperation in South Asia: a case from the Brahmaputra basin. **Journal** of Hydrology, v. 567, p. 60-70, December 2018. Available at: <u>https://doi.org/10.1016/j.jhydrol.2018.09.056</u>.

CABUS, T. Defining due diligence. In: CABUS, T. **Due diligence and the high seas**. London: Routledge, 2021. p. 103-134.. Available at: <u>https://doi.org/10.4324/9781003247845-5</u>.

CLIMATE DIPLOMACY. **Water diplomacy: a tool for climate action?** | SIWI World Water Week. Available at: <u>https://climate-diplomacy.org/events/water-diplomacy-tool-climate-action</u>.

DETGES, A.; POHL, B.; SCHALLER, S. Editor's pick: 10 violent water conflicts. **Climate Diplomacy**, 20 August 2017. Available at: <u>https://climate-diplomacy.org/magazine/conflict/editors-pick-10-violent-water-conflicts</u>.

FRANCKX, E. *et al.* **Bridge over troubled waters:** dispute resolution in the law of international watercourses and the law of the sea. *[S. l.]*: BRILL, 2020.

FREESTONE, D. The World Bank and sustainable development: legal essays. BRILL Nijhoff, 2013.

GARDNER, R. C.; DAVIDSON, N. C. The Ramsar Convention. In: LEPAGE, B. (Ed.). Wetlands. Springer, 2011. p. 189-203. Available at: <u>https://doi.org/10.1007/978-94-007-0551-7\_11</u>.

GIORDANO, M.; WAHAL, A. The water wars myth: India, China and the Brahmaputra – What the hydrology and geopolitics of the Brahmaputra River mean for India-China water relations. 8 December 2022. Available at: https://www.usip.org/publications/2022/12/water-wars-myth-india-china-and-brahmaputra.



HAN, H. Consumer behavior and environmental sustainability in tourism and hospitality: a review of theories, concepts, and latest research. Journal of Sustainable Tourism, v. 29, n. 7, p. 1021-1042, 2021. Available at: <a href="https://doi.org/10.1080/09669582.2021.1903019">https://doi.org/10.1080/09669582.2021.1903019</a>.

HEIDAR, T. New knowledge and changing circumstances in the law of the sea. BRILL Nijhoff, 2020. Available at: <a href="https://doi.org/10.1163/9789004437753">https://doi.org/10.1163/9789004437753</a>.

HOWDEN, J. G. The community of interest approach in international water law: a legal framework for the common management of international watercourses. **International Water Law Series**, v. 8, ISSN 2351-9606. Leiden: Brill, 2020. 243 p.

HUCK, W. The UN Sustainable Development Goals and the governance of global public goods. In: IOVANE, M. et al. (Eds.). **The protection of general interests in contemporary international law: a theoretical and empirical inquiry**. Oxford: Oxford University Press, 2021. p. 344-362. Available at: <u>https://doi.org/10.1093/oso/9780192846501.003.0015</u>.

KORNFELD, I. E. **Transboundary water disputes: state conflict and the assessment of their adjudication.** *[S. l.]:* Cambridge University Press, 2019. Available at: <u>https://doi.org/10.1017/9781316890776</u>.

KOTZUR, M. et al. Sustainable ocean resource governance: deep sea mining, marine energy and submarine cables. In: KOTZUR, M. et al. (Eds.). Sustainable ocean resource governance. Leiden: Brill Nijhoff, 3 January 2018. Available at: https://doi.org/10.1163/9789004360273.

LANGLET, D.; RAYFUSE, R. T. The ecosystem approach in ocean planning and governance: perspectives from Europe and beyond. In: LANGLET, D.; RAYFUSE, R. (Eds.). The ecosystem approach in ocean planning and governance: perspectives from Europe and beyond. BRILL Nijhoff, 2018. Available at: <u>https://doi.org/10.1163/9789004389984.</u>

LEPAGE, B. A. Wetlands: integrating multidisciplinary concepts. [S. I.]: Springer London, Limited, 2011.

MCCAFFREY, S. C. The law of international watercourses. 3. ed. Oxford: Oxford University Press, 2019.

MCCAFFREY, S. C.; MURRAY, J. S.; WOODHOUSE, M. (Eds.). Promoting equity, cooperation and innovation in the fields of transboundary waters and natural resources management: the legacy of Dr. David J. H. Phillips. **International Water Series**, v. 5. Leiden: BRILL Nijhoff, 2017.

MCINTYRE, O. International water law's role in addressing the problem of marine plastic pollution: a vital piece in a complex puzzle! **Chinese Journal of Environmental Law**, v. 6, n. 2, p. 218-252, 7 December 2022. Available at: https://doi.org/10.1163/24686042-12340086.

MOLENAAR, E. J. Integrating climate change in international fisheries law. In: MOLENAAR, E. J. **The law of the sea and climate change**. *[S. l.]*: Cambridge University Press, 2020. p. 263-288. Available at: <u>https://doi.org/10.1017/9781108907118.012</u>.

MOYNIHAN, R. Transboundary freshwater ecosystems in international law: the role, impact and future of the UNECE environmental regime. In: MOYNIHAN, R. Transboundary freshwater ecosystems in international law: the role and impact of the UNECE environmental regime. Cambridge: Cambridge University Press, 2021.. Available at: https://doi.org/10.1017/9781108854641.

MURPHY, L. International responsibility for global environmental harm: collective and individual. In: BESSON, S. (Ed.). **Theories** of international responsibility law. Cambridge: Cambridge University Press, 2022. p. 165-186. Available at: <a href="https://doi.org/10.1017/9781009208550.011">https://doi.org/10.1017/9781009208550.011</a>.



NARAYANAN, N. Dams responsible for South Asia's sinking deltas – Seven of South Asia's river deltas, including the Ganges-Brahmaputra, the Krishna and the Indus, are sinking faster than sea-level rise because of dam construction upstream. **The Third Pole**, 2014. Available at: <u>https://www.thethirdpole.net/en/climate/dams-responsible-for-south-asias-sinking-deltas/</u>.

NOORDA, A. Y. Climate change, disasters and people on the move: providing protection under international law. [S. l.]: BRILL, 2022.

PLATJOUW, F. M.; POZDNAKOVA, A. Environmental rule of law for oceans: designing legal solutions. [S. l.]: Cambridge University Press, 2023.

REDGWELL, C. Building resilience from the top down? The role of international law and institutions. In: REDGWELL, C. **Resilience in energy, infrastructure, and natural resources law**. *[S. l.]*: Oxford University Press, 2022. p. 32—C3.N91. Available at: <u>https://doi.org/10.1093/oso/9780192864574.003.0003</u>.

REVESZ, R. L.; SARINSKY, M. The social cost of greenhouse gases: legal, economic, and institutional perspective. Yale Journal of Regulation, v. 39, n. 2, p. 855-906, 2022.

RODRIGUES, P. C. The environmental protection of traditional knowledge and the active participation of indigenous peoples in the planning, management and decision-making processes as means of improving the effectiveness of environmental law. In: MALJEAN-DUBOIS, S. (Ed.). **The effectiveness of environmental law**. European Environmental Law Forum. Intersentia, 2017. p. 149-170. Available at: <a href="https://doi.org/10.1017/9781780687384.009">https://doi.org/10.1017/9781780687384.009</a>.

SALMORAL, G. et al. Water diplomacy and nexus governance in a transboundary context: In the search for complementarities. Science of The Total Environment, v. 690, p. 85-96, November 2019. Available at: https://doi.org/10.1016/j.scitotenv.2019.06.513..

SCHMEIER, S. What is water diplomacy and why should you care? Global Water Forum, 31 August 2018. Available at: <a href="https://www.globalwaterforum.org/2018/08/31/what-is-water-diplomacy-and-why-should-you-care/">https://www.globalwaterforum.org/2018/08/31/what-is-water-diplomacy-and-why-should-you-care/</a>.

SCHMEIER, S. International water law principles in negotiations and water diplomacy. **AJIL Unbound**, v. 115, p. 173-177, 2021. Available at: <u>https://doi.org/10.1017/aju.2021.21.</u>

SEHRING, J. et al. Diving into water diplomacy – Exploring the emergence of a concept. **Diplomatica**, v. 4, n. 2, p. 200-221, 26 August 2022. Available at: <u>https://doi.org/10.1163/25891774-bja10082.</u>

SIWI- STOCKHOLM INTERNATIONAL WATER INSTITUTE. Water governance. Available at: <u>https://siwi.org/why-water/water/governance/#:~:text=Water%20governance%20refers%20to%20the,related%20services%20and%20their%20benefits</u>.

STĂNILĂ, L.; STĂNILĂ, S. The right to a healthy environment and its consequences for other human rights: a challenging approach. In: POZZO, B.; JACOMETTI, V. (Eds.). **Environmental loss and damage in a comparative law perspective**. European Environmental Law Forum. Intersentia, 2021. p. 371-382. Available at: <u>https://doi.org/10.1017/9781839701191.022</u>.

SWAIN, A. Transboundary rivers and climate change: testing times for hydro-diplomacy to attain and maintain cooperation. STRIFE, 24 mar. 2016. Available at: <u>https://strifefinal.wordpress.com/2016/03/24/transboundary-rivers-and-climate-change-testing-times-for-hydro-diplomacy-to-attain-and-maintain-cooperation/</u>.

TEZER, A.; BODUR, H. O. The green consumption effect: How using green products improves consumption experience. **Journal** of Consumer Research, v. 47, n. 1, p. 25-39, 27 September 2019. Available at: .<u>https://doi.org/10.1093/jcr/ucz045</u>.



THE WORLD BANK. Water storage is at the heart of climate change adaptation. 3 February 2023. Available at: <a href="https://www.worldbank.org/en/news/feature/2023/02/03/water-storage-is-at-the-heart-of-climate-change-adaptation">https://www.worldbank.org/en/news/feature/2023/02/03/water-storage-is-at-the-heart-of-climate-change-adaptation</a>

TOMALOVÁ, E.; ULLRICHOVÁ, E. Water diplomacy — the new modus operandi of EU diplomacy? Innovative methods in diplomatic practice. **The Hague Journal of Diplomacy**, p. 1-22, 22 July 2021. Available at: <u>https://doi.org/10.1163/1871191X-bja10079</u>

UNITED NATIONS. **UN: World Water Development Report 2020. Water and Climate Change**. 2020. Available at: https://www.unwater.org/publications/un-world-water-development-report-2020

UNITED NATIONS. Transboundary Waters. 2021. Available at: https://www.unwater.org/water-facts/transboundary-waters

VISHWANATH, A. **Paddling upstream:** transboundary water politics in South Asia. Carnegie India, 10 October 2018. Available at: <u>https://carnegieendowment.org/files/Viashwanath\_GBM\_Basin\_October\_2018.pdf</u>.

VYKHRYST, S. Public information and participation under the Water Convention. In: **The UNECE Convention on the Protection and Use of Transboundary Watercourses and International Lakes**. Leiden: BRILL, 2015. p. 268-282. Available at: <u>https://doi.org/10.1163/9789004291584\_019</u>.

WETLANDS INTERNATIONAL. Integrated delta management. [*s.d.*] Available at: <u>https://www.wetlands.org/vibrant-coast-and-deltas/integrated-delta-management/#read-more.</u>

WORLD METEOROLOGICAL ORGANIZATION. **WMO HydroSOS in Ganga Brahmaputra Meghna Basin**. 26 November 2021. Available at: <u>https://wmo.int/media/news/wmo-hydrosos-ganga-brahmaputra-meghna-basin</u>.