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**IMPROVING THE EFFECTIVENESS OF WATER DIPLOMACY IN
RESOLVING THE PROBLEMS OF TRANSBOUNDARY RIVERS IN
KAZAKHSTAN**

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NORMATIVE REFERENCES

UN/EC Helsinki Convention (1992) - United Nations Economic Commission for Europe's Convention on the Protection and Use of Transboundary Watercourses and International Lakes

UN Watercourses Convention (1997) - United Nations Convention on the Law of the Non-navigational Uses of International Watercourses

Agreement on the Cooperation for the Sustainable Development of the Mekong River Basin, 1995

Almaty Agreement (1992) - Agreement between the CA countries for the establishment of a framework for cooperation in the field of water management

Helsinki Rules (1966) - International Law Association's rules on the uses of the waters of international rivers

Helsinki Rules on the Uses of the Waters of International Rivers (1966)

SADC Protocol (2000) - Southern African Development Community's Revised Protocol on Shared Watercourses

United Nations Convention on the Law of the Non-Navigational Uses of International Watercourses (1997)

United Nations Convention on the Protection of the Rights of All Migrant Workers and Members of Their Families (1990)

ACRONYMS AND ABBREVIATIONS

CA – Central Asia
RBE - River Basin Enterprises
BWA - Basin Water-Management Association
ICAB - Interstate Council for the Aral Sea Basin
ICWC - Interstate Commission for Water Coordination
IFAS - International Fund to Save the Aral Sea
IJC - International Joint Commission
IWRM - Integrated Water Resources Management
MRC - The Mekong River Commission
NBI - Nile Basin Initiative
NGO - Non-Governmental Organization
PDIES - Procedures for Data and Information Exchange and Sharing
PNPCA - Procedures for Notification, Prior Consultation, and Agreement
SADC - Southern African Development Community
SIC - Scientific Information Centre
TRB – Transboundary River Basins
UNDP - United Nations Development Program
WDF – Water Diplomacy Framework
WRM – Water Resource Management
WUA - Water Users' Association

INTRODUCTION

The management of transboundary water resources has emerged as a crucial global challenge in the 21st century, particularly in regions where rapid population growth, climate change, and socio-economic development have led to increased competition for scarce water resources. In Kazakhstan, the issue of transboundary water management is of paramount importance, given the critical role played by shared rivers in the nation's agricultural, industrial, and environmental sectors. Among these rivers, the Syr Darya, shared by Kazakhstan, Kyrgyzstan, Tajikistan, and Uzbekistan, is of particular significance due to its strategic importance and the complexities surrounding its governance.

The existing status of the Syr Darya River basin reveals a range of challenges that have hindered effective cooperation among riparian states. These challenges include the legacy of Soviet-era water management infrastructure, competing national interests, inadequate institutional arrangements, and insufficient trust-building efforts. While previous studies have explored various aspects of water diplomacy and transboundary water management in CA, there is a pressing need for research specifically focused on the Syr Darya River basin and the unique challenges it presents in the context of Kazakhstan.

The relevance of the study. The project contributes to the solution of a critical challenge associated with transboundary water disputes over the Syr Darya River, which have affected the regional stability in Central Asia, as well as the prosperity and development of the countries in the region. The scarcity of water resources in the CA region, in addition to climate change, makes this study on water diplomacy in Kazakhstan timely and meaningful. By focusing on the Kazakhstani context, this research will contribute to the growing body of knowledge on transboundary water governance and provide valuable insights for policymakers, water management practitioners, and researchers working in the field.

The aim of this project is to analyse the effectiveness of Kazakhstan's water diplomacy in resolving the transboundary water disputes over the Syr Darya River and offer policy recommendations. In order to achieve this aim, the author undertakes the following tasks:

1. Reviews the concept and issues in the study of water diplomacy;
2. Studies international experiences in solving transboundary water disputes;
3. Analyses the regional water disputes over the Syr Darya River;
4. Analyses the effectiveness of Kazakhstan's water diplomacy in solving transboundary water disputes over the Syr Darya River;
5. Develops policy recommendations aimed at increasing the effectiveness of Kazakhstan's water diplomacy in solving transboundary water disputes over the Syr Darya River.

Research novelty. First of all, by studying the experience of other countries in sharing transboundary river resources, this project aims to explore and identify best practices and experiences that could be applied to the Syr Darya River case. This

comparative analysis allows for a deeper understanding of the unique factors that contribute to the success or failure of Kazakhstan's water diplomacy in different settings.

Secondly, by analyzing the effectiveness of Kazakhstani water diplomacy, this project will contribute to the growing body of knowledge on transboundary water management.

Thirdly, by developing policy recommendations for resolving transboundary water disputes along the Syr Darya River, this study provides valuable insights for policymakers, water management practitioners and researchers.

Last but not least, with a focus on Kazakhstan's unique challenges and opportunities, this study will shed light on the intricacies of transboundary water cooperation in the region, which is often overlooked in the global water management discourse.

This study will take a qualitative research method such as document analysis and archival research. Primary and secondary sources include research documents such as treaties, agreements and policy documents related to transboundary water management.

By examining the political, social, and economic factors that influence transboundary water management in CA, as well as existing institutions and agreements, we expect to derive the following **results**:

1. Exploration of potential models and the best practices from other regions, such as the Mekong River Commission, which could be adapted and applied to improve water cooperation in CA.

2. Recommendations for strengthening regional cooperation through the integration of civil society, and the establishment of independent monitoring and assessment units.

The structure of the project. The master's project consists of an introduction, two chapters and a conclusion.

The first chapter will focus on the concept, theories, and contemporary issues in water diplomacy. It engages contemporary debates on water diplomacy, particularly exploring international experiences in solving transboundary water disputes.

The second chapter will delve into Kazakhstan's water diplomacy, using the case of the Syr Darya River as an example. It will explore the regional water disputes in CA related to the Syr Darya River and examine the effectiveness of Kazakhstan's water diplomacy efforts in this context.

Finally, the conclusion will summarize the main findings of the study, highlighting the key aspects of water diplomacy in Kazakhstan and the potential ways to improve it.

RESEARCH METHODOLOGY

This study will adopt a mixed-methods research design, which involves collecting and analyzing both qualitative and quantitative data to achieve research aim and objectives. This design allows for a comprehensive analysis and understanding of the complex issues related to transboundary water management and diplomacy in Kazakhstan.

As a case, the study will focus on the transboundary river Syr Darya. The case was chosen due to its strategic importance to Kazakhstan's socio-economic development, environmental sustainability, and regional cooperation.

The study will rely on primary and secondary data sources, including:

- treaties, agreements, and policy documents related to transboundary water management worldwide, in Kazakhstan and the broader Central Asian region.

- reports and publications from international organizations, governmental agencies, and non-governmental organizations involved in water management and diplomacy.

The collected data will be analyzed using a combination of qualitative and quantitative methods. Qualitative Data Analysis method is employed to analyze the textual data from treaties, agreements, policy documents, and journal articles. The analysis will focus on identifying themes, patterns, and key factors contributing to water diplomacy's effectiveness in the Kazakhstani context. Quantitative Data Analysis, specifically descriptive and inferential statistical techniques will be used to analyze quantitative data related to water availability, demand, and usage in the selected case studies. This will help assess the extent to which existing water diplomacy mechanisms have facilitated or hindered the resolution of regional conflicts.

Moreover, triangulation ensures the validity and reliability of the findings, the study will employ triangulation by comparing and contrasting data from multiple sources and methods. This approach will help to identify consistencies and discrepancies in the data, strengthening the overall conclusions of the research.

1 CONCEPT, THEORIES AND CONTEMPORARY ISSUES IN WATER DIPLOMACY

“The importance of water in the 21st century can be compared to oil in the 20th. However, the reality is that there are alternatives to oil such as natural gas, wind, solar and nuclear power. On the contrary, for industry and agriculture, as well as for drinking and sanitation, the only alternative to water is water.” [1]

1.1 Defining the Concept of water diplomacy

Diplomacy involves the adept handling of international relations through negotiations among state representatives or agencies. Zareie et al. (2020) give the definition of water diplomacy as “a strategic method for addressing water issues at local and transboundary levels when conflicts over water resource sharing arise” [2]. Hefny claims that water diplomacy is not related to the theory or concept but clearly is an action.

Klimes and others add that water diplomacy is a process that allows diverse stakeholders to explore collaborative solutions for managing shared freshwater resources [3]. It aims to create sustainable, peaceful outcomes while fostering cooperation among riparian parties. Key aspects include facilitating dialogue and fostering trust among stakeholders, which encompasses not only government entities but also non-state actors and sub-basin processes [4].

Water diplomacy can facilitate the exchange of information, experiences, and best practices among countries, helping build capacity and expertise in water management. This can lead to more informed decision-making and the development of innovative solutions to water challenges. Water diplomacy can support the development of robust legal and institutional frameworks for transboundary water management. By fostering cooperation and dialogue, water diplomacy can help countries establish mutually acceptable agreements, develop joint management plans, and create mechanisms for dispute resolution.

Numerous stakeholders, including agriculture, industry, urban and domestic users, and environmental needs, compete for limited water resources, leading to complex water distribution challenges [5]. Water diplomacy, as an approach to managing water resources, has gained prominence in recent years due to the growing scarcity of water, rapid population growth, and the increasing demand for water in various sectors such as agriculture, industry, and household. As a result, conflicts over water resources have intensified, particularly in protected areas. It can help resolve these conflicts, naming Transboundary River Basins (TRB), and serving as a sustainable water resource management tool.

Water resource management (WRM) in transboundary river basins is inherently complex due to conflicting national interests, different legal frameworks, and diverse socio-economic and cultural contexts. This often leads to disputes and tensions between riparian countries, potentially undermining regional stability and cooperation. Climate

change is causing unprecedented shifts in water availability and distribution worldwide, exacerbating existing water stress in many regions. Rising temperatures, changing precipitation patterns, and the melting of glaciers have led to increased variability in water resources, which in turn has intensified competition and conflicts over water.

Water diplomacy and transboundary water cooperation are related but distinct concepts that are often used interchangeably in the literature devoted to water diplomacy. Clarifying the differences between them can help advance both concepts and identify practical water diplomacy actions that complement existing cooperative activities.

Transboundary water cooperation refers to the collaborative management of shared water resources across political boundaries, usually involving formal agreements, institutions, and legal frameworks. It aims to promote equitable and sustainable use of water resources while minimizing potential conflicts.

Water diplomacy, on the other hand, involves the strategic use of negotiation, communication, and dialogue among actors to address water-related challenges and conflicts. It often focuses on building trust, fostering collaboration, and addressing broader political, social, and economic issues that influence water management [6].

Key differences between transboundary water cooperation and water diplomacy can be summarized in five categories:

1. Political: Transboundary water cooperation often involves formal political agreements and institutions, while water diplomacy focuses on fostering dialogue and understanding among actors, including non-state actors and stakeholders.

2. Preventive: Transboundary water cooperation aims to prevent conflicts through legal frameworks and agreements, while water diplomacy addresses emerging tensions and potential conflicts through dialogue and negotiation.

3. Integrative: Transboundary water cooperation integrates various water management aspects, such as quantity, quality, and ecosystems, while water diplomacy addresses broader political, social, and economic issues related to water.

4. Cooperative: Transboundary water cooperation promotes collaboration among states, while water diplomacy fosters trust-building and addresses power imbalances between actors.

5. Technical: Transboundary water cooperation often focuses on technical aspects of water management, such as infrastructure and data sharing, while water diplomacy emphasizes communication and negotiation skills to address water-related challenges.

Water problems are indeed complex and multifaceted, involving a wide range of stakeholders with competing interests and priorities. The competition for finite water resources is intense among agricultural, industrial, urban planning, and environmental preservation sectors, which makes it increasingly difficult to identify equitable and sustainable solutions. To effectively tackle these problems, a holistic and coordinated strategy is necessary to address these issues effectively, a comprehensive and integrated approach is required that considers the needs and objectives of all stakeholders while respecting the physical, disciplinary, and jurisdictional boundaries involved.

According to the report of the United Nations (World Population Prospects 2022), the global population is projected to reach nearly 10 billion by 2050, with most of the growth occurring in developing countries [7]. Rapid urbanization, particularly in water-scarce regions, puts additional pressure on already strained water resources, leading to increased competition among various users and sectors. The interdependence of water, energy, and food systems creates a complex web of interactions that can lead to conflicts over resource allocation.

Transboundary water disputes have been a prevalent issue in various parts of the world, with countries facing challenges in managing shared water resources. In the Nile River Basin, Egypt, Sudan, and Ethiopia have struggled to reach an agreement over the Grand Ethiopian Renaissance Dam's operation and filling. Meanwhile, Turkey's construction of dams under the Southeastern Anatolia Project has led to tensions with downstream countries Syria and Iraq, which depend on the Tigris-Euphrates River system.

The Indus River dispute between India and Pakistan, despite the Indus Waters Treaty of 1960, continues to experience occasional disagreements over dam and hydropower project constructions. The Mekong River Basin countries have also encountered conflicts over water resources management and sharing, particularly due to China's construction of dams on the river's upper reaches.

In the Jordan River Basin, water scarcity and infrastructure projects by Israel have sparked disputes over water allocation and access to resources, particularly for Palestine. Lastly, the CA countries sharing the Amu Darya and Syr Darya Rivers have faced long-standing issues over water distribution, with conflicting interests between upstream and downstream countries.

These examples highlight the complex nature of transboundary water disputes and emphasize the need for effective water diplomacy and cooperation in managing shared water resources. As previously noted, the increasing number of unresolved water disputes between countries suggests that in many regions, a well-defined legal and institutional framework for managing transboundary water resources is lacking. This absence makes it challenging to establish cooperation mechanisms and resolve disputes. Importantly, international water laws are often non-binding, meaning that parties have no legal obligation to fulfil their terms.

There is no single, universally applicable international law or supranational institution governing water disputes between countries. Nonetheless, several principles, agreements, and guidelines have been devised under international law to assist in managing transboundary water resources and addressing water disputes.

The key instruments and principles that provide guidance and a foundation for cooperation among countries sharing water resources are as follows:

1. The United Nations Convention on the Law of the Non-Navigational Uses of International Watercourses, adopted in 1997, is a key piece of international legislation concerning the usage and conservation of international watercourses. The convention aims to promote cooperation among nations sharing international watercourses, based on

principles of equitable and reasonable utilization and the obligation not to cause significant harm to other watercourse states [8].

2. The Helsinki Rules on the Uses of the Waters of International Rivers, adopted in 1966 by the International Law Association, was one of the earliest attempts to codify the laws concerning the utilization of international watercourses.

3. The Berlin Rules on Water Resources (2004): Also developed by the ILA, the Berlin Rules updated and expanded the Helsinki Rules, incorporating principles of integrated water resources management, environmental protection, and public participation.

4. Customary international law represents a set of rules that come from the consistent conduct of States, derived from their general and consistent recognition of these rules as law. This law is one of the primary sources of international law, alongside treaties and international agreements.

In the context of international water law, customary principles have played a significant role in guiding the use, management, and conservation of international watercourses. Even though they're not formally codified as treaties, these principles are widely accepted as law due to consistent practice and general agreement on their legal standing. Three main principles form the foundation of customary international water law:

1. Principle of Equitable and Reasonable Utilization: This principle asserts that all nations sharing an international watercourse have the right to use the watercourse in a way that is equitable and reasonable. This doesn't necessarily mean an equal division of water, but rather an equitable allocation considering a variety of factors, including social, economic, and environmental needs.

2. Obligation not to cause Significant Harm: While nations have a right to use shared water resources, they also have an obligation not to cause significant harm to other nations sharing the same watercourse. If a project or activity in one country causes significant harm to another, the first country may be required to cease the harmful activity, take measures to mitigate the harm, or compensate the affected country.

3. Duty to Cooperate: Countries are expected to cooperate in the management of shared watercourses. This includes exchanging data and information, providing timely notification and consultation about planned measures that could significantly affect the watercourse, and potentially even joint management strategies.

These customary principles have been enshrined in many international treaties and agreements, like the 1966 Helsinki Rules and the 1997 UN Convention on the Law of the Non-Navigational Uses of International Watercourses, and they continue to guide the management of shared water resources around the world.

As for supranational institutions, while there is no single global institution managing water disputes between countries, there are regional and river-basin-level institutions that play important roles in addressing transboundary water issues. These institutions often facilitate cooperation, provide technical assistance, and promote information exchange among riparian states. Examples of such institutions include:

1. The Mekong River Commission (MRC): A regional intergovernmental organization established by Cambodia, Laos, Thailand, and Vietnam to manage the shared resources of the Mekong River and promote sustainable development in the basin.

2. The International Joint Commission (IJC): Established by the United States and Canada under the Boundary Waters Treaty of 1909, the IJC manages water resources along the shared border and resolves disputes related to transboundary waters.

3. The Nile Basin Initiative (NBI): A regional partnership of the Nile riparian countries aiming at promoting equitable and sustainable management of the Nile River Basin's shared water resources.

Water diplomacy can provide a platform for dialogue and collaboration among riparian countries, fostering trust and understanding. By promoting shared water management principles and practices, water diplomacy can encourage regional cooperation and help avoid conflicts. The existing situation testifies to the great importance of water diplomacy.

In this subsection, we will discuss various contemporary theories and experiences in the realm of water diplomacy. By examining multiple frameworks and approaches to cross-border water resource management, we aim to gain a deeper understanding of the tools and strategies available for effective water diplomacy. We will outline 9 main theoretical approaches, like Integrated Water Resources Management (IWRM), stakeholder engagement and participation, and transboundary water agreements and treaties. These approaches encompass a diverse range of perspectives, experiences, and lessons learned, which can be instrumental in addressing the challenges of transboundary water management and fostering cooperation among riparian countries.

Through a thorough examination of these contemporary theories and experiences, we aim to provide valuable insights into the complex and multifaceted world of water diplomacy. By understanding the various approaches and tools available, policymakers and stakeholders can better navigate the challenges of transboundary water management and develop effective strategies for fostering cooperation and achieving sustainable outcomes.

Janjua in the article *“Addressing the supply-demand gap in shared rivers using water diplomacy framework: utility of game theory in the Indus River within Pakistan”* investigates mistaken approaches lying at the core of the WRM issues. According to researchers, over time, central governments have often employed *top-down strategies* for water resources management without consulting water users or society. Such approaches are prevalent worldwide and have had limited success. Centralized management has prioritized supply increase over demand management, resulting in inefficient development projects. The poor quality and efficiency of water services create a vicious cycle where dissatisfied users are unwilling to pay water fees, hindering providers' ability to maintain infrastructure and causing service quality to decline. This, in turn, worsens water productivity and contributes to aquifer depletion and water pollution. Inadequate water pricing does not promote conservation or efficiency, allowing for wasteful practices and inefficient operations to persist [9].

There are many *theoretical approaches* and frameworks to the issues of cross-border water resources management. We list the main ones below.

1. Integrated Water Resources Management (IWRM): A comprehensive and coordinated approach to managing water resources, considering social, economic, and environmental factors [10].

Global Water Partnership defined IWRM as “*an approach that encourages the integrated planning and administration of water, land, and associated resources, aiming to optimize economic and social benefits fairly while preserving the long-term health of essential ecosystems* [11].”

2. Stakeholder engagement and participation: Involving all relevant stakeholders, including local communities, governments, and industries, in decision-making processes related to water management and diplomacy.

Stakeholder engagement and participation is a crucial approach in WRM. It emphasizes the involvement of all relevant parties, such as local communities, governments, and industries, in the decision-making processes associated with water resource management. This inclusive approach ensures that the diverse interests, needs, and concerns of all stakeholders are taken into account when formulating policies and implementing strategies. Local communities, often neglected in many approaches, possess invaluable knowledge about their water resources, which can contribute to the development of sustainable management practices. Their involvement ensures that the social, cultural, and environmental aspects of water management are adequately addressed, ultimately leading to more equitable and sustainable outcomes.

Active participation of stakeholders fosters a sense of ownership and accountability, encouraging cooperation and collaboration among different groups. This, in turn, helps to build trust and minimize potential conflicts arising from competing demands for water resources. Moreover, engaging stakeholders at various levels facilitates the exchange of knowledge, ideas, and expertise, leading to more informed and effective decision-making.

It correlates with the research of *Grech-Madin et al.* conducted in 2018. They proposed a model with three key instruments of water diplomacy: political, multi-level and normative. In the political field, the focus is on politically functional and effective nation-state rules and a "list of rules" for water management at the interstate level. The multilevel tool includes ethnography and field data collection from sub-state water users. Finally, the normative properties tool works within countries, using geo-referenced disaggregated data to map changes in water resources and conflict risks (Figure 1).

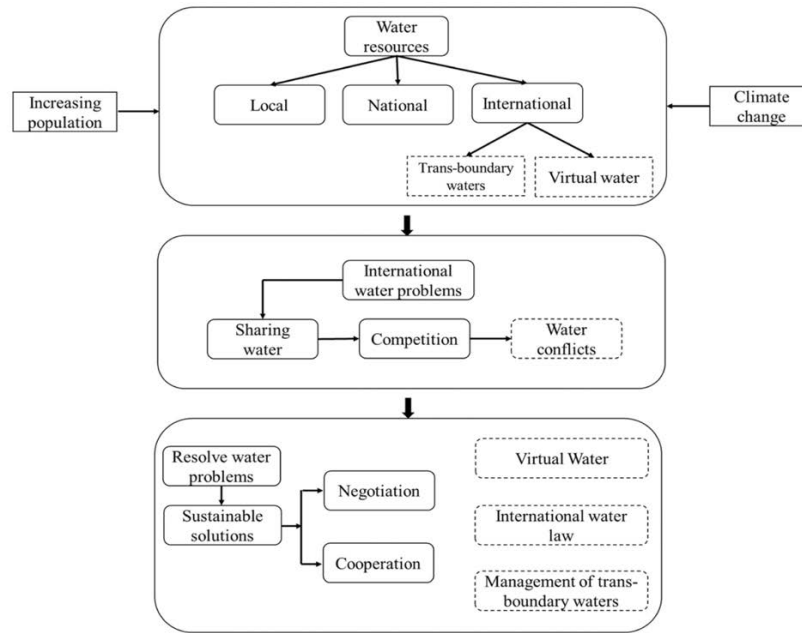


Figure 1 - Concepts of water diplomacy according to Grech-Maddin (2018) [12]

Gleick's model for evaluating a nation's vulnerability refers to a framework developed by Peter Gleick, a water resources expert, to assess a country's vulnerability to water-related problems. The model takes into account several factors such as water availability, water quality, economic and political stability, and the ability to manage and mitigate the impacts of water-related problems.

The model consists of four key components:

1. **Physical Exposure:** This refers to the availability of water resources in a country and its susceptibility to natural disasters such as droughts, floods, and storms. Countries with limited water resources or those located in areas prone to natural disasters are more vulnerable.

2. **Sensitivity:** This component takes into account the degree to which a country's economy and population depend on water resources. Countries heavily reliant on water for agriculture, industry, and other economic activities are more vulnerable.

3. **Adaptive Capacity:** This refers to a country's ability to cope with and adapt to water-related problems. Factors that influence adaptive capacity include governance structures, economic resources, technological capabilities, and social infrastructure.

4. **Exposure Reduction:** This component refers to the actions taken to reduce a country's vulnerability to water-related problems. These actions include developing water storage facilities, improving water management practices, and promoting water conservation.

By considering these four components, Gleick's model provides a comprehensive framework for evaluating a nation's vulnerability to water-related problems. The model can be used to identify areas where improvements can be made to reduce vulnerability

and to develop strategies to improve a country's overall resilience to water-related challenges [13].

1. Transboundary water agreements and Treaties [14]

According to Cooley and Gleick (2011), transboundary water agreements and treaties have emerged as crucial instruments for governing shared water resources, promoting cooperation, and preventing potential conflicts among neighbouring countries. These legal frameworks can take on diverse forms, such as international conventions, bilateral or multilateral treaties, and regional cooperation arrangements [15].

Let's have a look at the essential ones.

The Indus Waters Treaty of 1960, for instance, serves as a cornerstone for water allocation and infrastructure development between *India and Pakistan*. By effectively managing the waters of the Indus River and its tributaries, the treaty also provides a dispute resolution mechanism to address any emerging issues [16].

In the realm of global affairs, the 1997 United Nations Convention on the Law of the Non-Navigational Uses of International Watercourses emerges as a pivotal document outlining key principles and recommendations aimed at fostering fair and sustainable governance of international water bodies. This convention emphasizes the significance of international collaboration, fair and just utilization, and the obligation of nations to avert substantial damage to neighbouring countries [17].

To address this challenge, these four countries came together in 1994 and made an agreement. They decided to cooperate for the sustainable development of the Mekong River Basin, which means they agreed to use the river's resources in a way that meets their needs without harming the ability of future generations to meet their own needs.

As a part of this agreement, they created an organization called the Mekong River Commission. The role of this commission is to help these countries plan and coordinate their actions related to the river. This means that before one country does something that might affect the river, they work together with the other countries to make sure everyone's needs and concerns are addressed.

So, the 1994 Agreement and the Mekong River Commission are examples of how countries can work together to manage shared natural resources, like a river, in a way that is fair and sustainable [18].

The European region has seen the adoption of the 1992 Helsinki Convention on the Protection and Use of Transboundary Watercourses and International Lakes, which aims to protect and ensure the sustainable use of transboundary water resources in the region. It encompasses both surface and groundwater resources, fostering cooperation, information exchange, and joint management among riparian states [19].

Lastly, the Nile River Basin countries came together in 1995 to sign an agreement focused on resolving conflicts over the use of the Nile River. This cooperative framework led to the establishment of the Nile Basin Initiative, which seeks to facilitate collaboration and sustainable development within the basin. The issues of this agreement are covered in the article of Paisley and Henshaw "Transboundary governance of the Nile River Basin: Past, Present and Future" [20].

These agreements and treaties represent a wide range of approaches to transboundary water management. Their success often hinges on political will, effective implementation, and adherence to the principles and mechanisms agreed upon by the participating nations.

There is much criticism about this kind of approach since as it was mentioned above, countries using one-side policies always use a top-down approach that predominately covers Water Supply Issues (WSI) instead of WRM and acts on demand neither on prevention of ecological disasters.

2. Capacity building and knowledge sharing: Enhancing the skills, knowledge, and expertise of water managers and decision-makers through training, research, and information exchange.

Training programs, workshops, and seminars are instrumental in capacity-building efforts, as they provide valuable opportunities for water professionals to learn from experts and peers, acquire new skills, and stay up-to-date on best practices and emerging technologies in water management. Moreover, these forums facilitate the exchange of experiences and lessons learned among professionals from different countries and regions, promoting collaboration and mutual learning [21].

An ASCE Task Committee in 1990 carried out a survey involving 563 engineering professionals to assess the sufficiency of existing educational programs in the field of water resources engineering. Results of the survey showed that research plays a pivotal role in advancing the knowledge base for water management and diplomacy. By conducting studies that explore various aspects of water resources, such as hydrology, water quality, and the socio-economic implications of water use, researchers can contribute valuable insights to inform evidence-based decision-making. Furthermore, interdisciplinary research can help bridge the gap between the natural and social sciences, fostering a more holistic understanding of the complexities involved in water resource management [22].

Burian and others (2017) claim that information exchange platforms, such as online databases, networks, and conferences, serve as vital tools for sharing knowledge and resources among water professionals worldwide. These platforms enable stakeholders to access relevant data, research findings, and case studies, allowing them to make informed decisions and adopt best practices in their respective contexts [23].

3. Adaptive management

Adaptive management is an approach that emphasizes flexibility and continuous learning in the face of changing conditions and new information. One notable example of adaptive management is Australia's Murray-Darling Basin Plan. This comprehensive water management plan is designed to ensure the long-term health and sustainability of the Murray-Darling River system, which spans across four Australian states [24].

As Hart (2016) notes, The Basin Plan incorporates adaptive management strategies that involve regular monitoring of water resources and adjusting management practices based on updated data and evolving conditions. This approach allows for a more dynamic response to emerging challenges, such as climate change, population growth, and competing demands for water resources.

4. Water pricing and allocation mechanisms

The water markets in California and Australia's Murray-Darling Basin use economic instruments to encourage efficient and equitable water use, by enabling users to trade water rights and allocations [25].

5. Demand management

Israel's implementation of water-saving technologies, recycling, and efficient irrigation practices has significantly reduced water consumption, making the country a leader in water demand management.

These technologies include drip irrigation (Israel pioneered in this technology), desalination, and water recycling. Israel has developed advanced water management systems that utilize sensors, data analytics, and automation to optimize water distribution, reduce leakages, and minimize waste [26].

6. Climate change adaptation and resilience

The Netherlands, being a low-lying country with a significant portion of its land below sea level, is particularly vulnerable to the impacts of climate change, such as sea-level rise, increased river discharges, and extreme weather events.

The Dutch Delta Program develops strategies to cope with the impacts of climate change on water resources, including changes in water availability, demand, and quality, through innovative infrastructure projects and adaptive management practices [27].

7. Science-based decision-making

According to Morris and de Loë, in Canada, the development of the Mackenzie River Basin Transboundary Waters Master Agreement was informed by scientific research and data, ensuring that water management policies and strategies were grounded in evidence-based knowledge [28].

In summary, the significance of water diplomacy and integrated water resource management cannot be overstated when it comes to tackling the intricate challenges linked to shared water resources. In addressing this issue, a range of strategies, including stakeholder involvement, transboundary agreements, capacity enhancement, and adaptive management, have demonstrated their efficacy in fostering collaboration and sustainable water governance across diverse geographical and political landscapes.

The importance of employing a comprehensive approach that encompasses legal, technical, and diplomatic instruments, alongside the active engagement of all pertinent stakeholders, becomes evident in the pursuit of sustainable and equitable water resource management. By drawing lessons from these instances and embracing the most effective strategies in water diplomacy and management, nations can strengthen their ability to confront the growing challenges presented by climate change, population expansion, and conflicting water needs. This approach not only facilitates regional stability but also fosters cooperation among nations.

1.2 International Experience in Solving Transboundary Water Disputes

Transboundary water disputes have been a growing concern in the global community as increasing demands, climate change, and geopolitical factors exacerbate conflicts over shared water resources. With more than 260 river basins spanning across international boundaries, effective cooperation and conflict resolution among riparian countries are essential for ensuring sustainable water management and promoting regional stability. The international experiences in resolving transboundary water disputes provide invaluable insights into a range of approaches, mechanisms, and best practices that can be adapted to tackle similar challenges in other regions. By closely examining a case study of the Mekong River Basin, we can uncover the most effective experiences that contribute to successful cooperation, as well as the persistent challenges that require attention.

1.2.1 The Mekong River Basin case and its relevance to the Syr Darya River Basin

According to MacQuarrie et al (2008), The Mekong River Basin, spanning six countries - China, Myanmar, Laos, Thailand, Cambodia, and Vietnam - is a prime example of international cooperation in resolving transboundary water disputes. The Mekong River, the world's twelfth longest river, plays a crucial role in the economic development, food security, and livelihood of millions of people in the region. However, competing interests and demands for water resources have led to tensions and disputes among these countries [29].

The Mekong River basin can be divided into two distinct regions: the upper Mekong Basin (UMB) and the lower Mekong Basin (LMB). The upper Mekong Basin, known as the Lancang River in China, encompasses the northern part of the Mekong River. It is located in China and extends through its southwestern provinces.

On the other hand, the lower Mekong Basin primarily spans Southeast Asia. The Mekong River passes through several countries in this region, including Myanmar, Thailand, Laos, and Cambodia. Finally, the Mekong River flows into Vietnam, forming the Mekong Delta.

The Mekong River basin is renowned for its remarkable biodiversity, particularly in terms of river fauna. It is considered the second most biodiverse river ecosystem globally, following the Amazon River. The basin's diverse range of species includes various animals and plants that inhabit the river and its surrounding areas [30]. The river, with its immense ecological, economic, and cultural importance, has been a source of cooperation and conflict among these nations. In the Lower Mekong Basin, the contribution of the Upper Mekong Basin can amount to as much as 30% of the flow during the dry season, or constitute 16% of the total annual water flow. Except for the region around Khone Falls, the river is open to sea boats up to 5,000 deadweight tones till Phnom Penh, Cambodia. The Mekong Delta and the area between Chiang Saen, Thailand, and Guan Lei, China, are where most commercial shipping [31].

The main industry using water in the Basin is agriculture, which is intensely developed in Thailand and Viet Nam but considerably less so in Cambodia and the Lao PDR [32]. Less than 10% of the 15 million hectares of agricultural land in the LMB are

irrigated during the dry season, which amounts to roughly 1.2 million hectares. Limited and completely uncontrolled dry season flows, which new reservoirs in the basin would significantly reduce, and the expense of abstracting from the mainstream prevent the expansion of the current levels of irrigation. The Viet Nam Delta receives all flows that are needed for economic, environmental, and social reasons, including preventing saltwater intrusion (Figure 2).

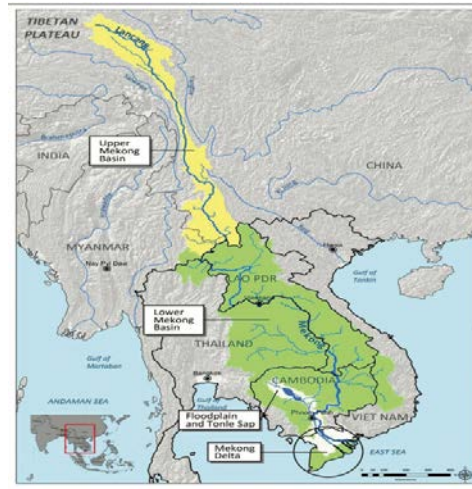


Figure 2 - Mekong River Basin [33]

As the countries in the region rely heavily on the river for their water, food, and energy needs, disputes over water resources have emerged, particularly regarding dam construction and water allocation. Conflicting interests among the riparian countries have led to tensions, making effective water diplomacy crucial for the sustainable management of the basin.

1.2.2 Main Institutions of Negotiation in the Mekong River Basin

The legal basis for water mediation and negotiation in the Mekong River Basin includes international agreements and regional frameworks. There are three main institutions that take participation in the development of the region.

The Mekong River Commission (MRC)

The Mekong River Basin faces numerous challenges, including uncoordinated dam construction, insufficient data sharing, weak enforcement of agreements, and growing water demand. Some proposed solutions include enhancing regional cooperation through existing frameworks like the MRC, encouraging more inclusive decision-making processes, promoting transparency, and fostering trust among riparian countries. Furthermore, implementing integrated water resources management and focusing on

sustainable development can contribute to addressing the transboundary issues in the Mekong River Basin.

In 1995, the *Mekong River Commission (MRC)* was created. This group includes representatives from different governments, which means it's an "intergovernmental body." The Mekong River runs through several countries in Southeast Asia, and this group focuses on that region, which is known as the Mekong River Basin.

The main goal of the MRC is to encourage these countries to work together, or "foster collaboration," and to promote sustainable progress within the Basin. "Sustainable progress" means development that meets the needs of the present without compromising the ability of future generations to meet their own needs. So, the MRC wants to make sure that the countries using the Mekong River do so in a way that is fair and won't cause long-term damage to the river or the environment [34]. Its membership comprises Cambodia, Laos, Thailand, and Vietnam, while China and Myanmar participate as dialogue partners. The core mission of the MRC is to facilitate the sustainable governance and utilization of water resources and associated assets in the Mekong River Basin, with the ultimate aim of promoting the economic, social, and environmental well-being of the region's inhabitants.

The MRC has played a significant role in fostering cooperation and dialogue among the riparian countries. Through the commission, member countries have access to a platform for discussing and resolving water-related issues, sharing data and information, and developing joint projects and initiatives. The MRC has established various procedures and rules for water use, including *Procedures for Notification, Prior Consultation, and Agreement (PNPCA)*, which aim to ensure that any proposed water infrastructure projects do not adversely impact other member countries.

The MRC has also facilitated technical and capacity-building support for member countries. This has helped enhance their understanding of the river basin's hydrological, environmental, and socioeconomic dynamics, and promoted the adoption of integrated water resources management rules [35].

The MRC is a critical institution in promoting cooperation and dialogue among riparian countries, providing technical assistance, and facilitating the exchange of information (Figure 3).

The development of an effective and sustainable water resource model is encouraged by integrated water resource management (IWRM), a worldwide strategy to lessen transnational problems and social conflicts brought on by conflicting water requirements. For intricate rivers like the Mekong River Basin, where resources and ecosystems are intertwined, this strategy is essential.

The Mekong River Commission (MRC) has implemented Integrated Water Resources Management (IWRM) program as the foundation for basin-wide planning processes that adhere to the principles of IWRM.

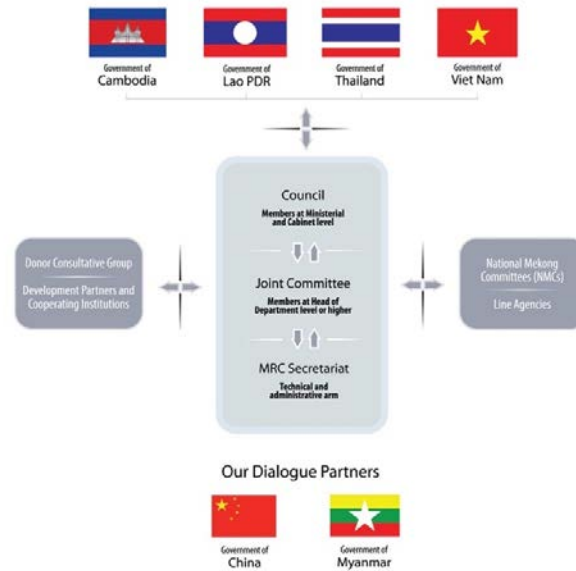


Figure 3 - Governance structure of the Mekong River Commission (MRC)

The MRC Secretariat comprises four divisions, one office, and over 60 staff members based in Vientiane and Phnom Penh. The divisions are:

1. Administration Division (AD): Provides administrative support, including financial transactions, human resources, IT, and organizing governance meetings.

2. Environmental Management Division (ED): Implements core river basin management functions, including environmental monitoring and strategy formulation for environmental impact assessments and the State of the Basin Report.

3. Planning Division (PD): Formulates development strategies, supports the implementation of MRC procedures, and manages assistance in various sectors, such as climate change, agriculture, and navigation.

4. Technical Support Division (TD): Manages databases, information systems, forecasting, and research, as well as supports data sharing, flow maintenance, and water use monitoring (Mekong River Commission, 2023) [36].

5. The Office of the Chief Executive Officer (OCEO) oversees strategic planning, international cooperation, communication, monitoring, evaluation, fundraising, and organizational development. It also supports the formulation and adoption of key strategies and MRC procedures. The Mekong Integrated Water Resources Management Project, based on 15 years of experience in the development of water use, is the basis of all programs of the Mekong Commission (Table 1).

Implementing Countries	Title of Joint Projects	Sectors	Estimated cost (US\$)
Lao PDR and Thailand	Lao-Thai safety regulations for navigation	Navigation	1,000,000

Implementing Countries	Title of Joint Projects	Sectors	Estimated cost (US\$)
Cambodia and Lao PDR	Cross border water resources development and management, including environmental impact monitoring of Don Sahong hydropower project	Hydropower Environment	1,500,000 100,000/year (impact monitoring)
Cambodia and Thailand	Transboundary cooperation for flood and drought management in Thai-Cambodian border area – a part of 9C-9T Sub-area	Flood/drought management	1,200,000
Cambodia, Lao PDR, and Viet Nam	Sustainable water resources development and management in the Sekong, Sesan and Srepok river basins (3S Basin)	Hydropower, environment, flood and drought	2,610,000
Cambodia and Viet Nam	Integrated flood management in the border area of Cambodia and Viet Nam in the Mekong Delta for water security and sustainable development	Flood protection, agriculture	2,730,000 2,000,000 (border canals, floodways)

Table 1 Implementation arrangements [37]

The tabular representation delivers a comprehensive outline of collaborative initiatives undertaken by diverse nations in the Mekong River Basin. It accentuates the titles of the projects, sectors encompassed, and projected expenses. The aforementioned cooperative initiatives are geared towards tackling significant concerns pertaining to the management of water resources, ensuring safety in navigation, promoting the development of hydropower, monitoring environmental impact, managing floods and droughts, and fostering sustainable development across international boundaries.

The Lao People's Democratic Republic (Lao PDR) and Thailand are collaboratively engaged in a project aimed at developing safety regulations for navigation along the Mekong River, which is a shared waterway between the two countries. The initiative endeavours to augment navigation practises and guarantee the safety of vessels traversing the area, with a projected expenditure of \$1,000,000.

Cambodia and Lao PDR have collaborated to execute a transnational initiative for the development and management of water resources. This initiative comprises multiple facets, which entail the monitoring of the environmental impact of the Don Sahong hydropower project. The projected expenditure for this all-encompassing undertaking is \$1.5 million, accompanied by an extra yearly cost of \$100,000 that is exclusively designated for the purpose of monitoring the impact.

The 9C-9T Sub-area, situated along the Thai-Cambodian border, is the focal point of a transboundary collaboration initiative between Cambodia and Thailand, which aims to address issues related to flood and drought management. The collaborative initiative seeks to improve cooperation and devise tactics to alleviate the effects of floods and droughts in the area, with an anticipated expenditure of \$1,200,000.

The nations of Cambodia, Lao PDR, and Vietnam have collaborated on a venture with the objective of promoting sustainable development and management of water resources in the Sekong, Sesan, and Srepok river basins, which are commonly referred to as the 3S Basin. This all-encompassing initiative, projected to incur a cost of \$2,610,000, encompasses a variety of domains, such as hydropower, environmental conservation, flood control, and drought mitigation. The objective of the project is to advance the sustainable exploitation of water resources, while concurrently safeguarding the environment and implementing efficient measures to manage floods and droughts.

Cambodia and Vietnam have engaged in a joint effort to implement an integrated flood management initiative in the border region of Cambodia and the Mekong Delta area of Vietnam. This initiative prioritises water security and sustainable development by implementing flood protection measures and agricultural support strategies in the region. The projected expenditure for this endeavour amounts to \$2,730,000, accompanied by an extra allotment of \$2,000,000 designated exclusively for the development of border canals and floodways.

The collaborative endeavours serve as a demonstration of the dedication of the involved nations to tackle common obstacles and foster interregional collaboration within the Mekong River Basin. Through the consolidation of resources, specialised knowledge, and financial support, these initiatives strive to attain enduring water resource management, augment safety in navigation, alleviate ecological repercussions, and proficiently regulate instances of flooding and drought. These nations endeavour to promote sustainable development and safeguard the welfare of the population dependent on the Mekong River and its adjacent regions by means of cooperative endeavours and collective obligations.

Under the 1995 Mekong Agreement, a Basin Development Plan (BDP) is a mandatory requirement and acts as a guiding framework for the Joint Committee in identifying, classifying, and prioritizing projects and programs at the basin level. The BDP aligns with the fundamental objectives and principles outlined in the Agreement, with particular emphasis on the first three articles out of a total of 42.

The key points of the first three articles of the Mekong Agreement are as follows:

1. **Areas of Cooperation:** The riparian states commit to working together to develop, utilize, manage, and conserve water resources in the Mekong River Basin for various purposes and mutual benefits. This cooperation aims to prevent adverse consequences arising from natural or human activities.

2. **Planning, Programs, and Projects:** The Agreement encourages and facilitates the coordinated development of the basin's long-term benefits for all riparian states, focusing on joint or basin-wide projects and programs. The Basin Development Plan plays a crucial role in identifying and prioritizing projects within the basin.

3. **Protection of the Environment and Ecological Balance:** The Agreement emphasizes the need to prevent pollution and mitigate negative impacts resulting from development plans or the utilization of water and associated resources in the Mekong

River Basin. This includes protecting the environment, natural resources, and aquatic life, and maintaining the ecological balance.

These initiatives and the principles outlined in the Mekong Agreement demonstrate the commitment of the member countries to collaborative action, sustainable development, and environmental stewardship in the Mekong River Basin. By adhering to these principles, the countries strive to ensure the responsible and equitable management of water resources while safeguarding the basin's ecological integrity (Table 2).

Strategic Priorities	For Basin Development	For Basin Management
(i)	Address ongoing developments, including in Lancang-Upper Mekong Basin	Establish objectives & strategies for water-related sectors
(ii)	Expand and intensify irrigation for food security and poverty reduction	Strengthen national water management processes
(iii)	Enhance sustainability of hydropower development	Strengthen basin management processes
(iv)	Acquire knowledge to minimize risks and uncertainties	Develop environmental and social objectives, "baseline indicators"
(v)	Explore benefit and risk sharing options	Implement targeted IWRM capacity building program
(vi)	Adapt to climate change	
(vii)	Integrate basin planning into national systems	

Table 2 Strategic Priorities for Basin Development

The basin aims to achieve the following outcomes by 2030:

1. Maintain the ecological function of the Mekong:

a. Ensure adequate river flows and quality to support a healthy environment: This means making sure the river has enough water flowing through it, and that the water is clean enough to support plants, animals, and people who rely on it.

b. Manage sediment transport to mitigate bank erosion and land subsidence: Sediment is soil or sand that gets moved around by water. If too much sediment gets carried away, it can lead to the river banks eroding (falling apart) and the land sinking down (subsidence). This goal aims to manage sediment to prevent these issues.

c. Enhance ecosystem services from the river and wetland habitats: Ecosystem services are the benefits people get from nature, like clean water, food, or even recreational opportunities. This goal aims to improve these benefits, particularly from the river and nearby wetlands.

2. Enable inclusive access and utilization of water and related resources:

a. Secure food, water, and energy for basin communities: This means ensuring that people living in the area have enough to eat and drink, and enough energy for things like heating and cooking.

b. Increase employment and reduce poverty among vulnerable people depending on river resources: Some people rely heavily on the river for their livelihoods. This goal aims to create more job opportunities for these people and to reduce poverty levels.

3. Enhance optimal and sustainable development of water and related sectors:

a. Increase economic growth for all basin countries through proactive regional planning: This goal is about boosting the economies of the countries that share the Mekong River, by carefully planning how to manage and use the river's resources.

b. Enhance inclusive growth and sustainability in irrigated agriculture, hydropower, navigation, environment, and fisheries sectors: This means promoting growth and sustainability in various sectors that rely on the river, like farming (which needs water for irrigation), power generation (hydropower), shipping (navigation), conservation (environment), and fishing (fisheries).

4. Strengthen resilience against climate risks, extreme floods, and droughts:

a. Improve information and preparedness for basin communities against floods and droughts: This involves helping communities in the basin get ready for floods and droughts, by giving them the information they need to plan and prepare.

b. Enhance disaster management and adaptation to water resources development and climate risks: This means improving how disasters are managed when they do occur, and helping communities adapt to the changes brought about by development and climate change.

5. Strengthen cooperation among all basin countries and stakeholders:

a. Strengthen the MRC for more effective implementation of the 1995 Mekong Agreement: The Mekong River Commission (MRC) is the group that helps manage the Mekong River. This goal is about making the MRC stronger and more effective.

b. Increase joint efforts and partnerships for more integrated management of the basin: This means getting all the different people and groups involved in managing the Mekong River to work together more closely, for better results.

The Greater Mekong Sub-Region's development initiatives

The Greater Mekong Sub-Region's development initiatives are carried out within the framework of many institutions. The Greater Mekong Subregion Program (GMS Program), which has a complicated organizational structure, is the biggest and has the longest history among the Mekong River Commission (MRC) organizations.

In contrast to the Mekong River Commission (MRC), which grants observer status to China and Myanmar and only includes the Lower Mekong countries, the Greater Mekong Subregion (GMS) program has included all six Mekong countries since its inception. Additionally, the GMS program's primary objective is the comprehensive and collaborative development of the entire region, rather than solely addressing river-related

issues. At the same time, since the emergence of the CRM in its current form in 1995, both institutions, whose mandates synergistically complement each other, have been closely interacting in practice, both directly and through Asian Development Bank [38].

The Greater Mekong Cooperation Program identified nine priority sectors for cooperation:

1. Transport infrastructure: Formation of three economic corridors linking various territories within the region, development of trade, tourism and attraction of investments. Further development of the road network, waterways and railway transport is planned.

2. Agriculture: Development of intra-regional trade in agricultural products, use of advanced bioenergy technologies, ensuring sustainable agricultural growth and food security.

3. Energy: Rationalization of energy trade, and implementation of major projects in the field of energy generation, including the construction of hydroelectric power plants and the interconnection of electricity networks.

4. Environment: Finding a balance between development needs (e.g. hydropower) and wildlife conservation, taking into account the environmental risks associated with intensive development. Adoption of a 10-year Main Environmental Program in the subregion in 2006.

5. Human resource development: Implementation of many initiatives, including epidemic control, migration flow management, mutual recognition of diplomas and professional certificates, and staff development.

6. Investments: Creation of a regional investment forum for investment management.

Telecommunications: Transforming the existing information highway into a broadband information superhighway for the transmission of various types of data across all six countries.

7. Tourism: Development of the GMS as a single tourist destination, promotion of the development of transport and telecommunications structures, as well as human potential.

8. Transport and Trade Facilitation Action Program (adopted in 2010): Improvement of customs systems, border and sanitary regulations, and cross-border transport agreements.

9. The Greater Mekong Cooperation Program covers many areas such as human resources, investment, telecommunications, tourism, transport and trade in order to ensure sustainable development and integration of the region [39].

The Lower Mekong Initiative (LMI)

The Lower Mekong Initiative (LMI) was launched in 2009 during the visit of the then US Secretary of State H. Clinton to the region. As part of this initiative, the countries of the region are cooperating in the following areas:

1. Agriculture and food security: The goal is to ensure sustainable agriculture and food security for the people of the region.

2. Connectivity: This aspect concerns the development of physical, institutional and interpersonal connections within the region and within ASEAN using American experience, trade and innovation. The goal is to reduce the gap in the levels of development of the ASEAN countries.

3. Education: Emphasis is placed on promoting technical English, improving communication between researchers and disseminating best technical practices.

4. Energy Security: The initiative aims to reduce dependence on the export of fossil hydrocarbons and develop alternative energy sources, as well as the integration of energy networks.

5. Protecting the Environment and Water Resources: Efforts are focused on the rational use of water resources, reducing the risk of floods and droughts, providing access to high-quality drinking water and preserving ecosystems in the face of economic growth.

6. Healthcare: includes epidemiological control, the fight against counterfeit drugs, cooperation in the implementation of international medical standards and the dissemination of best medical practices [40].

The LMI has become a platform for cooperation between the countries of the region and the United States in a number of key areas such as the environment, healthcare, and education [41].

The Lower Mekong Initiative (LMI), the GMS Program, and the MRC are seen to work well together. Other smaller or more specialized institutes exist as well for collaboration and cooperative development [42].

International donors, including development agencies, banks, and non-governmental organizations, play a vital role in supporting the Mekong River Basin's sustainable management. They provide financial and technical assistance for various projects related to water resources, capacity-building, and environmental protection. These donors help bridge the gaps between the riparian countries and promote regional cooperation.

Since the establishment of the MRC in September 1957, development projects in the Greater Mekong sub-region have been carried out with active foreign support. In the context of the Cold War, Western countries, including Japan, saw the economic development of the region as a way to prevent the spread of communist ideas and the influence of the USSR and the PRC. They also sought to explore the potential of the region, especially the Mekong, with the prospect of economic benefits, including the development of hydropower [43].

After the end of the Vietnam War in 1975 and the beginning of regional and global political changes in 1985, foreign aid to the countries of the Greater Mekong subregion, both financial and organizational and technical, played a significant role in their rapid economic development [44].

In 1995, the Committee comprising Thailand, Laos, Cambodia, and Vietnam was restructured and transformed into the Mekong River Commission (MRC) to revive quadrilateral cooperation. The MRC serves as an intergovernmental organization dedicated to promoting collaboration and sustainable development in the Mekong River

Basin. To support its operations and initiatives, the Commission receives funding from various international organizations and countries.

The funding sources for the MRC include a diverse range of countries such as Australia, Belgium, Germany, Denmark, Luxembourg, the Netherlands, New Zealand, the United States, Finland, France, Switzerland, Sweden, and Japan. Additionally, prominent organizations including the Asian Development Bank, the Association of Southeast Asian Nations (ASEAN), the European Union (EU), the International Union for Conservation of Nature (IUCN), the United Nations Development Programme (UNDP), the United Nations Economic and Social Commission for Asia and the Pacific (ESCAP), the World Bank, and the World-Wide Fund for Nature (WWF) also contribute financial support to the Commission.

During an informal gathering of development partners held in Phnom Penh on June 27-28, 2013, it was reaffirmed that these entities were committed to providing financial assistance to the Mekong River Commission until 2030. This affirmation highlights the long-term commitment of the development partners to support the Commission's efforts and initiatives in promoting sustainable development and cooperative management of the Mekong River Basin. The financial support received from these diverse sources enables the MRC to undertake its crucial work in the region effectively [45].

However, challenges remain in the Mekong River Basin. China's construction of large hydropower dams upstream has raised concerns among downstream countries regarding the potential impacts on water flow, sediment transport, and fisheries [46]. While China shares hydrological data with the MRC and has participated in various dialogues, it is not a full member of the commission, which limits the extent of cooperation and coordination on transboundary water issues.

There exist multiple factors that have influenced China's decision to abstain from joining the Commission. A salient factor pertains to the fact that other prominent waterways in China, namely the Yangtze and Yellow River, lack transboundary flows and are confined solely within the territorial boundaries of China. As a result, China regards the Mekong River as a distinctive instance that necessitates making concessions to countries downstream within the established framework. Since the year 2002, China has been sharing hydrological information pertaining to the Lancang River. This information includes daily data from two stations. The agreement in question has undergone two extensions, namely in 2008 and 2013. It is worth noting that China is the leading international riparian party in terms of sharing information with the Mekong River Commission (MRC), as reported by Kittikhoun and Staubli (2018).

Myanmar's involvement in regional collaboration and governance is restricted, given that merely 4% of its land area is situated within the Mekong Basin, which constitutes a mere 2% of the overall flow (Backer, 2007). The regime's efficacy is constrained by the non-participation of China and, to a lesser degree, Myanmar, although both nations retain their positions as dialogue partners. This implies that they dispatch representatives to conferences and engage in the Commission's undertakings in a proactive manner. China's unchecked actions in the upper sections of the river are a major source of friction in the

Mekong Commission's work. 13.5% of the flow belongs to China, which makes active use of these water resources. China's construction of dams on the Mekong caused the river's water level to critically decrease in 2004 and 2010. The inability to navigate the river, environmental harm, and the potential for an economic disaster for the entire region were all brought on by the Chinese government's refusal to release some of the water that hydroelectric dams had accumulated during the dry season.

To lessen the effect of its own hydroelectric projects on river flow in nations downstream, the Chinese government is taking action. In particular, the Ganlanba hydroelectric power station's capacity was decreased, and the facility was converted from an electricity-generating plant into a typical reservoir with flow control features to maintain the Mekong's water level outside of China [47].

China places a lot of emphasis on the development of hydropower and constructs a complex network of dams on the Mekong River. This is relevant to the proposed lower Mekong dams because it is anticipated that upstream dams would alter river flow, increasing the economic worth of downstream dams. China actively encourages the development of hydroelectric power facilities by the nations around the lower Mekong River and offers its help.

Since China has not ratified any of the international treaties governing relations in the area of transboundary water use, it is not a party to international water law. As a result, the PRC operates within the bounds of its own legal system and is not liable for any transboundary effects [48].

The Chinese government adheres to the custom of only holding bilateral consultations when a transboundary river crosses the borders of more than two nations. Data on water consumption are kept as a governmental secret, which makes it difficult to jointly monitor the condition of the watercourse. - China doesn't inform interested parties while undertaking projects or building river infrastructure that might have effects beyond international borders.

The transboundary water management experience of the Mekong River Basin provides important lessons and best practices for other places looking to solve comparable concerns. The achievements and difficulties in this field have been influenced by a number of variables.

Successes:

1. Collaboration and cooperation: Since its establishment in 1995, the Mekong River Commission (MRC), which is composed of Cambodia, Laos, Thailand, and Vietnam, has promoted communication and cooperation. In order to address common issues about water resource management, this cooperation has been essential. The MRC supports integrated water resource management (IWRM), which strives to balance the basin's economic, social, and environmental demands. The area has been able to make better plans and decisions because of this all-encompassing strategy.

2. Data sharing and cooperative monitoring: The MRC has put in place systems for data sharing and cooperative monitoring of water resources, which promotes mutual trust among the member nations and offers crucial data for making decisions.

3. The Procedures for Data and Information Exchange and Sharing (PDIES) was approved at the MRC Council's 6th meeting in 1999, marking a significant policy decision. The PDIES institutionalized hydrological data and water-related information sharing within the regime, addressing the need for basin-wide data for planning, development, and monitoring purposes.

In 2001, the MRC Information Services (MRC-IS) was established to manage data, and in 2002, the Joint Committee adopted guidelines for its management. Line Agencies from each riparian country act as "Primary Custodians," responsible for initially collecting, processing, and storing the data to be shared. The MRC Data and Information Services Portal (DISP) allows users to access various types of data, including spatial, time series, non-spatial, and technical documents. The Mekong Information Platform facilitates information exchange on integrated water resources management, while the Community Site ensures data access through the DISP. The MRC Technical Assistance and Coordination Team (TACT) developed a Data Delivery Schedule for datasets required by MRC Programs (Figure 4).

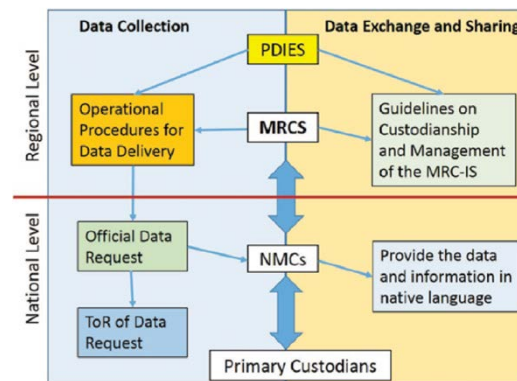


Figure 4 - Process of Data Collection [49]

4. Building capacity and offering technical support: The MRC has given member nations technical assistance and training to help them become better at managing their water resources.

Challenges:

1. Political tensions and past wars among the nations in the Mekong River Basin might make it difficult for them to work together on water management. It is still difficult to cultivate diplomatic ties and build confidence between the nations.

2. Inadequate resources and funding: The MRC and its member nations often have financial difficulties, which might hinder the success of their water management projects. The Mekong area has witnessed fast economic development and rising population pressures, which have raised the demand for water supplies and placed more strain on the river system.

3. Climate change and environmental degradation: As a result of the increased frequency of severe weather events, such as floods and droughts, rivers are flowing more slowly and there are fewer water resources available. Additionally, attempts to manage water are made more difficult by environmental deterioration in the basin caused by industrial pollution, agricultural practices, and deforestation.

4. The transboundary water management experience of the Mekong River Basin concludes by emphasizing the significance of collaboration, integrated resource management, data sharing, and capacity development in achieving sustainable water management. It also highlights the difficulties brought about by political divisions, a lack of resources, fast expansion, and environmental problems. The Mekong nations will need to continue working together, investing, and using adaptive solutions to deal with these issues.

To conclude, addressing the transboundary issues in the Mekong River Basin effectively is essential to strengthening existing institutions and mechanisms while exploring new avenues for cooperation.

2 KAZAKHSTAN'S WATER DIPLOMACY: THE CASE OF THE SYR DARYA RIVER

2.1 The Syr Darya River and Regional Water Disputes around it

Since ancient times, CA rivers such as the Syr Darya and the Amu Darya have played an important role in the development of the region. Habitats in CA (hereinafter CA) use rivers for irrigation in agriculture, drinking and transportation, hydroelectric power generation, manufacturing and for leisure activities like swimming and boating. As shown on the map, the region includes the current independent countries such as Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan and Uzbekistan (Figure 5).

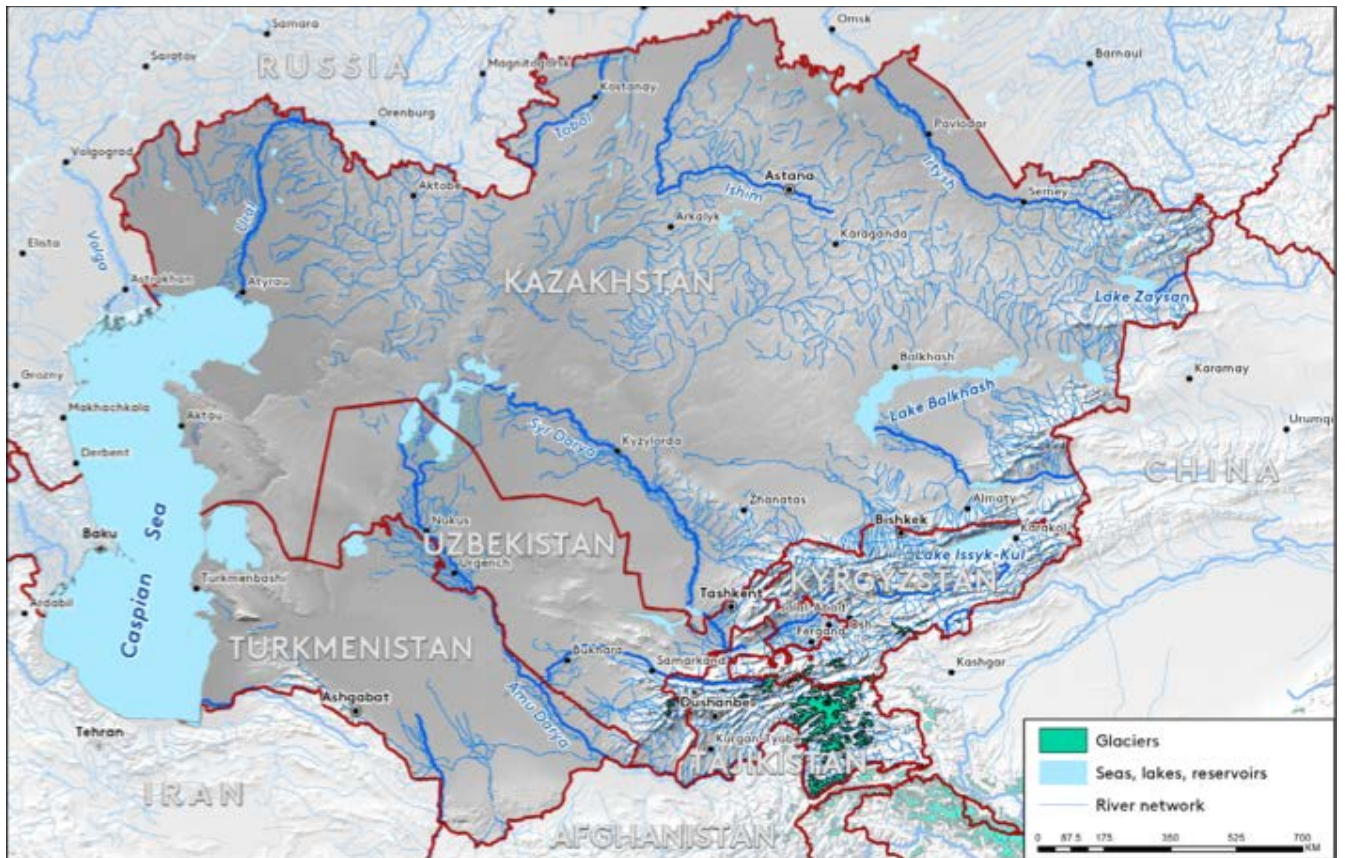


Figure 5 - Map of CA [50]

Bordering CA to the north lies Russia, to the east China, to the south Afghanistan and Iran, and to the west the Caspian Sea along with the nations of the South Caucasus. The region spans an area of approximately 4 million square kilometres.

Deserts, including the Karakum and Kyzylkum, define the southern and western areas of the region. The climate in these desert zones is characterized by extreme heat and aridity, with minimal rainfall. Two major rivers, the Amu Darya and the Syr Darya, supply

a significant portion of CA's water resources and are crucial for the region's growth and sustenance of its people.

The Syr Darya is the longest river in CA and has the second most water flowing through it. Its length from the Naryn River's source is 3,019 km, and the size of its basin is 219,000 km². The Central (Inner) Tian Shan is where the Syr Darya originates. The river is known as the Syr Darya from the location where the Naryn and Kara Darya converge. Snow is the primary source of the river, which is supplied by both glaciers and snowfall. The water regime, which begins in April, is characterized by spring and summer floods. June is when the flow is at its highest. Kazakhstan is where the Syr Darya's flow is mostly generated. The Syr Darya then flows through Uzbekistan, Tajikistan, and Kazakhstan before emptying into the Aral Sea.

The rivers of the Aral Sea basin get water from various types of surface and groundwater sources, including rain, snow, glaciers, and both seasonal and permanent snowfall. The amount of each source varies depending on where in an altitudinal strip the river basin is located. Due to the climatic and hydrological characteristics of the area, the hydrographic network of the Aral Sea basin is characterized by an incredibly unequal distribution of bodies of water, including the river network.

The mountains of the Aral Sea basin are skirted by a vast river network in the Piedmont plains. The majority of them are irrigation canals that redirect the flow from the river network and distribute it over irrigated land within their command area, giving it a very distinctive character. Most of the tributaries do not empty into the Syr Darya because of excessive water removal for cultivation. The Ohangaron, the Chirchiq, and the Keles are a few of the right tributaries that the Syr Darya takes in as it leaves the Fergana Valley. The final right tributary, the Arys, enters the Syr Darya below Shardara.

I.Kolossova claims that during the Soviet era, the region's water supply was centralized, with countries like Tajikistan and Kyrgyzstan, situated in the upper river basins, providing water to downstream countries. In exchange, Kazakhstan, Turkmenistan, and Uzbekistan supplied energy resources. However, following the dissolution of the Soviet Union, each country began managing its water resources independently, leading to challenges concerning the exchange of water and energy resources [51].

The upstream and downstream countries have different economic interests. Kyrgyzstan and Tajikistan are focusing on electricity generation, while Kazakhstan, Uzbekistan and Turkmenistan are active in agriculture. During the summer, energy companies want to store water for winter power generation, while farmers need water during the summer irrigation season.

During Soviet times, Central Asia actively developed irrigated agriculture to meet irrigation needs. Kazakhstan, Turkmenistan and Uzbekistan were the main countries for agricultural production, while Kyrgyzstan and Tajikistan provided water for irrigated land in neighbouring countries. This enabled efficient management of water resources in the region. After the collapse of the USSR, however, new treaties and agreements on the use of transboundary rivers became necessary.

After independence, each Central Asian republic began to pursue its own interests in water use, leading to tensions in the region. Kyrgyzstan and Tajikistan saw water on their territories as a national treasure, while Kazakhstan, Turkmenistan and Uzbekistan saw it as a shared resource. This has been a source of conflict. Tensions and fears increased particularly among the downstream countries when Kyrgyzstan and Tajikistan announced the construction of hydroelectric power stations, creating fears of water scarcity.

For 30 years of independence, the Central Asian states have been unable to agree on water allocation. One possible solution was to maintain the mechanism established during the Soviet era, with water supply from upstream in the summer and electricity supply from downstream in the winter. After the collapse of the USSR, however, each country began to assert its own interests, resulting in the disruption of the hydropower balance. Turkmenistan and Uzbekistan cut off energy supplies to Kyrgyzstan and Tajikistan, forcing them to seek alternative sources, including the construction of hydroelectric power stations.

The water crisis in Central Asia stems from three main factors: rapid population growth, pollution and climate change.

As Mosello fairly claims, water sharing should not be viewed as a zero-sum game, as cooperative interdependence can benefit all parties. However, when cooperation fails, social and ecological disasters can occur, like the Aral Sea crisis [52]. In his work "*Water in CA: a prospect of Conflict or Cooperation*" he assumed that the regional states' perception of water resources as a *zero-sum game* hinders cooperation. This perception is influenced by political factors (recent independence and weak leadership), social factors (population growth and ethnic tensions), and economic factors (self-sufficient political economy and competing interests between agriculture and energy sectors). Consequently, states "securitize" water issues, raising national security concerns, which increases conflict potential and reduces regional cooperation chances. This is evident in the inefficiency of current institutions and treaties for shared water management in CA.

According to UN forecasts, by 2025 the population of Kyrgyzstan, Tajikistan, Uzbekistan, Turkmenistan and Kazakhstan should grow to 85 million people [53]. Population growth also leads to an increase in the demand for agricultural and industrial products. The crisis of water resources in CA is also exacerbated by the deterioration of water quality. Its deterioration is caused by pollution with chemical poisons and pesticides used in agriculture, as well as by the discharge of polluted industrial and municipal waters into rivers and collector-drainage networks.

The challenges surrounding water management in Central Asia (CA) are multifaceted, stemming from competing political, economic, environmental, and human demands. The region, which includes major downstream countries like Kazakhstan and Uzbekistan, has a rapidly growing population, projected to swell to approximately 75 million by 2030 and potentially 90 million by 2050. These countries, despite being resource-rich and highly industrialized, rely on upstream nations such as Kyrgyzstan and Tajikistan for their water supply, as they control the primary cross-border rivers.

Further complicating the situation is climate change, which over the past half-century has led to a 40% reduction in the glacier area that feeds the Syr Darya and Amu Darya rivers. By mid-century, river flows in these basins could drop by 10-30%. This change, combined with pressures from population growth and increasing industrial activities, could severely strain the region's water resources.

Access to clean water is paramount for sustainable development in this region. However, rapid glacier melt, mild winters, and population growth put significant strain on the environment, challenging the replenishment of water resources.

It's worth noting that the escalating pressure on CA's water resources isn't just due to scarcity but is also a byproduct of political, economic, and social factors. As water resources become more strained, they're increasingly leveraged as tools of political influence. Therefore, any solutions to CA's water challenges need to address this complex web of factors. In 1995, the presidents of the CA countries signed the Nukus Declaration, recognizing the shortage of water in the region and the need for multilateral cooperation. However, disagreements between the downstream and upstream states deepened, leading to conflicts, especially between Kyrgyzstan and Uzbekistan. In 1998, an Agreement was adopted on the joint use of water and energy resources in the Syr Darya River Basin, which provided for mutually beneficial cooperation between Kyrgyzstan, Kazakhstan and Uzbekistan. But the agreement was of a framework nature and many details remained unresolved, which led to its violation and subsequent loss of force.

Even though alliances like the International Fund for Saving the Aral Sea (IFAS) received significant support from the World Bank, Asian Development Bank (ADB), and other international organizations and financial institutions, none of the proposed water and energy cooperation agreements from 1993-2010 managed to gain unanimous approval from the CA countries.

In the Syr Darya River Basin, there are several key aspects to consider regarding water management. On the positive side, all riparian states have established some form of national institutional arrangements for water management, demonstrating a willingness to participate in multilateral water agreements. This shows that there is an underlying foundation for cooperation and the potential for more effective collaboration in the future.

However, the basin currently faces significant challenges. Cooperation among the riparian states mainly takes place on an ad hoc or bilateral basis, which exacerbates the already substantial environmental, socio-economic, and political difficulties experienced in the region. This lack of consistent and coordinated cooperation also contributes to the heavy water stress faced by the states sharing the basin.

Despite these challenges, there are opportunities for improvement. The Syr Darya River Basin already has some necessary infrastructure in place for regional water management. By reforming, developing, and funding this infrastructure, it is possible to enhance its performance and address the basin's water-related issues more effectively. This would require concerted efforts from all involved parties, but could ultimately lead to better water management and cooperation in the region [54].

Water and hydroelectric resources found in the Syr Darya can support the republics' continued economic development and prosperity. As a result, the Agreement also outlines future coordinated activities between the governments for enhancing the Naryn-Syr Darya basin's irrigation and energy efficiency. The chiefs of state unambiguously expressed their views and resolved to create a worldwide water and energy consortium with the goal of

Kazakhstan is one of the least developed nations in this regard, as shown by the present status of water supply in the CIS nations. The particular water supply in Kyrgyzstan is 245 thousand cubic meters, respectively, per sq. km. and 11,763 thousand cubic meters per person, compared to 37 thousand cubic meters per square kilometre and 6 thousand cubic meters per person annually in Kazakhstan. The supply of the nation with water resources is crucial to the growth of Kazakhstan's economic sectors as a whole, as well as of its regions, regions, and individual cities. 85% of the water used to serve the different economic sectors comes from surface waterways, with the other 15% coming from underground, the sea, and sewage [55].

In terms of water content each year, Kazakhstan's surface water resources total 100.5 cubic kilometres, of which only 56 square kilometres are located within the territory of the republic; the remaining 44 cubic kilometres are imported from nearby nations. Numerous factors, including geographic location, terrain, temperature, evaporation, moisture coefficient, etc., affect how rivers are distributed across the nation. Permanent streams are more common in the north than rivers, which are less common in the south but have a greater network of transient streams. It should be noted that Kazakhstan's water resources are dispersed quite unevenly across the country. The eastern half, and 1/4 of the southeastern and southern parts, contain the majority of the world's water resources. In contrast to oil, which is a finite and depletable resource, water is a commodity that may be traded.

On the other hand, a cautious approach to water resources is required since there are currently and continue to be water shortages in many parts of the globe. In order to create a project for the transport of water from the Ganges to CA, the World Bank for Reconstruction and Development made a significant financial commitment. An initiative to pump water from the Amu Darya to Afghanistan has been created by Japanese scientists. The northern and central regions of Kazakhstan are already in need of more water.

The Syr Darya provides water for the south, although Uzbekistan and Kyrgyzstan monopolize the flow of the river. The transboundary river, the Syr Darya, is crucial for the growth of Kazakhstan's economy. The quality of life in the Aral Sea area is improving quickly. It is not necessary to skip over the 1990s of the previous centuries when almost all industrial firms in the area shut down and thousands of professionals lost their jobs, in order to grasp this.

The hamlet endured the crisis hard; the major crop, rice, had a reduction in output of more than 50% over those years; and the agricultural method used to produce grains was flagrantly abused, leading to exceptionally poor yields. Saying that around 40% of the region's population was living in poverty at the time can help you understand the severity

of the problem. Of course, the ecological catastrophe of the Aral Sea also made the area more problematic. The Law "On the Social Protection of Citizens Affected by an Environmental Disaster in the Aral Sea Region" was created according to a court ruling. The designation of the area as an "Ecological Disaster Zone" after the approval of the treaty permitted the populace to obtain substantial compensation in the form of environmental coefficients to salaries, pensions, and other benefits.

The President also spearheaded the creation of the innovative "Regulation of the Syr Darya River Bed and Preservation of the Northern Part of the Aral Sea" project as soon as the nation's economy began to grow. A man-made sea, called the Small Aral, was created. Amazing outcomes from its use have been achieved, resolving several significant issues. During the challenging time of the flood, the Syr Darya's flow control has improved, the river's carrying capacity has grown, and pastures and hayfields have received water. The second phase of the eight-object worldwide environmental initiative PRRSAM is now being prepared. After this project is completed, Kazakhstan's water area will once again rise.

The UN Convention on the Protection and Use of Transboundary Watercourses and International Lakes, and the Convention on the Law of the Use of International Watercourses) both emphasize that countries sharing bodies of water, like rivers or lakes, need to use these resources in a fair and reasonable way. This means not using more than their fair share and not causing damage to the water or the surrounding environment that could affect the other countries.

What's more, these conventions stress that countries need to consider the fact that these water bodies cross borders when they're planning or carrying out activities that might impact the water. This could include things like building a dam or starting a large-scale irrigation project. They need to ensure these activities won't negatively affect the other countries sharing the water.

So, these conventions are international agreements that guide countries on how to share and manage transboundary water bodies in a way that's fair, sustainable, and takes into account the interests of all the countries involved.

2.2 Kazakhstan's Water Diplomacy over the Syr Darya River

2.2.1 Analysing Kazakhstan's water diplomacy in the Syr Darya River Dispute

The Government of the Republic of Kazakhstan has implemented necessary measures to prevent potential emergencies in the lower reaches of the Syr Darya River. This includes allocating annual budgetary resources for the maintenance and repair of protective dams in the Kyzylorda area along the Syr Darya River. To minimize water usage, water was directed into deserts and unpopulated regions through irrigation canals and ancient channels, eliminating the need for repairs or restoration of these canals.

However, increased winter expenses resulted in the flooding of extensive coastal areas, causing delays in spring field operations.

Despite the implementation of various preventive measures to mitigate the impact of floods, significant economic and social damage occurred in the affected area. Numerous settlers were evacuated from the flood-prone zone, communities and agricultural lands were submerged, hydraulic infrastructure and roads were destroyed, and material damages in the two areas amounted to around 2 billion tenge.

The ongoing work in the first phase of the "Regulation of the Syr Darya River and Preservation of the Northern Part of the Aral Sea" project aims to prevent similar emergencies in the future, cease the forced discharge of water into Arnasay, and improve the environmental conditions in the region surrounding the Aral Sea. The second phase of the project, approved by the Water Resources Committee of the Ministry of Agriculture of the Republic of Kazakhstan, includes the construction of the second stage of the North Aral Sea dam, raising the water level in the Small Sea to 46.0 m BS, and the development of a hydroelectric power plant within the Aklak hydraulic structure with an annual electricity generation capacity of up to 23 MW. Other initiatives involve repair and restoration work at the head structure of the Kyzylorda Left-bank main canal, rehabilitation of the Aksai-Kuvandarya Lake system, construction of the Raim hydroelectric complex, and the establishment of two bridges across the Syr Darya to replace the current pontoon crossings. In total, approximately 500 km of protective dams will be repaired or constructed. Furthermore, there are plans to examine the water balance and develop a simulation model of the Syr Darya River.

Another pressing issue is the insufficient availability of water for irrigation during the growing season. This issue arises due to similar factors as the increased winter releases of water. In periods of very dry years, the water supply in the lower parts of the river worsens, as the Toktogul reservoir loses its significance as a long-term control reservoir due to necessary drawdowns in the winter and reduced summer inflows. Consequently, the reservoir's water supplies are inadequate to meet the water needs of the lower reaches of the Syr Darya River [57].

The construction of additional reservoirs on the Uzbek side, with a capacity to store approximately 2 billion cubic meters of water, raises concerns for the lower sections of the Syr Darya River, particularly its deltaic system.

The artificially low water levels resulting from reservoirs operating in energy mode severely limit the potential for irrigation-based agriculture during the growing season. This leads to inadequate irrigation schedules, causing crops to dry out and receive insufficient water, ultimately resulting in poor yields.

Water resource management is a critical issue for Kazakhstan, particularly regarding the Syr Darya River which it shares with neighbouring countries. The importance of adhering to international water law and fostering a spirit of mutual respect and trust in the sharing of these resources cannot be overstated.

Framework agreements and conventions recognized globally, like the Convention on the Protection and Use of Transboundary Watercourses and International Lakes (1992)

and the Convention on the Law of the Non-Navigational Uses of International Watercourses (1997), serve as foundational guides for interstate water resource utilization in Central Asia.

These conventions establish an equitable framework for countries sharing water resources and outline essential cooperative measures for the management of transboundary waters. Importantly, Kazakhstan, Uzbekistan, and Turkmenistan have all signed the Convention on the Protection and Use of Transboundary Watercourses and International Lakes.

For a more effective regional water management system, it would be beneficial if Kyrgyzstan and Tajikistan, which control primary transboundary watercourses, also adopt this Convention. This would be a significant step towards better interstate cooperation in managing shared water resources.

Without adequate organizational, legal, and financial support at both the interstate and national levels, the successful development of the region in terms of water conservation, water allocation, and management of transboundary waters cannot be ensured. The Committee for Water Resources in the Republic of Kazakhstan has made substantial efforts in this regard. In recent years, various initiatives have been sponsored to enhance the ecosystems of river basins, restore irrigation and drainage systems, and allocate funding for the maintenance and operation of interstate water bodies throughout the country. Both domestic and foreign funding sources are utilized to finance these projects.

2.2.2. Policy recommendations for resolving the Syr Darya River disputes

Cooperative frameworks should ideally begin at the national level, taking into account the intersection of water systems in the region. Initiatives like IWRM encourage coordination, harmonization of legislation, and research and information exchange. River basin organizations often face challenges such as a lack of technical expertise, poor staffing, and weak executive direction. The transboundary river Syr Darya poses a significant opportunity and challenge for the riparian countries involved. To ensure sustainable management and utilization of its water resources, a comprehensive recommendation policy is crucial. This policy aims to outline key principles and measures that promote cooperation, environmental protection, and equitable sharing of benefits among riparian countries. Based on the analysis of the current problems and challenges that Kazakhstan faces in its policy towards the Syr Darya, as well as the study of the case of interethnic policy towards the Mekong River, we will offer specific recommendations for improving the situation:

1. Cooperative Governance:

a. Establish a cooperative framework: Riparian countries should establish a joint institutional mechanism that facilitates regular communication, collaboration, and

decision-making on Syr Darya River issues. This framework should promote transparency, inclusivity, and equal participation of all stakeholders.

b. Develop a management plan: It is essential to develop a comprehensive river basin management plan that addresses water allocation, pollution control, environmental conservation, and disaster management. This plan should consider the needs and priorities of all riparian countries, ensuring sustainable and integrated management of the Syr Darya River system.

2. Equitable Water Allocation and Management:

a. Fair water sharing: Promote fair and equitable allocation of water resources among riparian countries based on principles of reasonable and equitable utilization. Establish mechanisms for sharing information on water availability, demand, and usage to ensure efficient and effective water management.

b. Environmental flow requirements: Allocate sufficient water to maintain healthy river ecosystems, especially during critical periods. Protect and restore wetlands, floodplains, and other vital habitats to preserve biodiversity and ecosystem services.

c. Integrated management approach: Encourage riparian countries to adopt an integrated water resources management approach. This includes promoting water conservation, efficient irrigation practices, and exploring alternative water sources to reduce dependence on the Syr Darya River.

3. Environmental Protection and Restoration:

a. Pollution prevention and control: Implement measures to minimize pollution from various sources, such as industrial discharges, agricultural runoff, and municipal waste. Establish water quality standards and monitoring programs to ensure compliance and take appropriate actions against polluters.

b. Ecosystem restoration and conservation: Undertake collaborative efforts to restore and protect degraded ecosystems along the Syr Darya river. This includes reforestation, wetland conservation, and riparian zone management. Promote sustainable land management practices to reduce soil erosion and sedimentation.

c. Climate change adaptation: Develop strategies to address the impacts of climate change on the Syr Darya river system. This involves assessing vulnerability, promoting climate-resilient infrastructure, and integrating climate considerations into water resources planning.

4. Data Sharing and Exchange:

a. Establish a data sharing mechanism: A centralized data repository forms a key aspect of this model. It serves to store, manage, and disburse the collected data, akin to the Mekong River Commission's Data and Information Services Portal (DISP). Accessibility to all participating countries is crucial, alongside the implementation of robust security measures to safeguard sensitive data.

c. The formulation of clear data-sharing protocols is necessary to ensure seamless data exchange. Aspects such as data submission formats, frequency, and methodologies, along with the roles and responsibilities of each nation in data management, need to be delineated.

d. Equally important is the development of human resource potential through capacity-building initiatives such as training programs and workshops. These ensure that the personnel involved in data management are equipped with the requisite skills to collect, process, and analyze data.

e. Strengthen early warning systems: Collaborate on the development and implementation of early warning systems for floods, droughts, and other hydrological hazards. Timely exchange of information can help mitigate risks and minimize potential impacts on communities and infrastructure.

5. Capacity Building and Financial Cooperation:

a. Enhance capacity: Strengthen technical and institutional capacities of riparian countries through knowledge sharing, training programs, and exchange of expertise. Support the development of skilled professionals and robust institutions responsible for water resources management.

b. Financial cooperation: Encourage international financial institutions, donor agencies, and bilateral partners to provide financial and technical support for sustainable water management projects in the Syr Darya River basin. Promote fair and efficient financial mechanisms for sharing the costs and benefits associated with transboundary water management.

This recommendation policy highlights the importance of cooperation, sustainable management, and environmental protection in managing the transboundary river Syr Darya. By adopting these principles and implementing collaborative measures, riparian countries can ensure equitable water allocation, promote ecosystem conservation, and achieve long-term sustainability in the utilization

By implementing these steps, countries sharing transboundary river basins can develop robust data-sharing mechanisms that enable informed decision-making, collaboration on joint projects, and effective management of shared water resources.

In summary, the Mekong River Basin's experience in transboundary water management offers valuable lessons and best practices for the Syr Darya River Basin, including the importance of institutional mechanisms for cooperation, balancing competing demands, adapting to climate change, and promoting data sharing and joint monitoring.

CONCLUSION

In conclusion, this thesis has explored the complexities of water resource management in transboundary river basins, focusing on the CA context. The study examined the challenges and opportunities for cooperation, taking into account the political, social, and economic factors that shape the interactions between the regional states. The hypothesis proposed that the perception of water resources as a zero-sum game, driven by the political, social, and economic context, has hampered cooperation and led to the securitization of water-related issues in the region.

The analysis demonstrated that existing institutions and treaties, such as the ICWC and IFAS, have struggled to establish effective cooperation and equitable water quotas due to the competing interests of the CA states. However, the literature suggests that regional and international institutions can play a crucial role in promoting cooperation and mitigating conflicts over shared water resources. The adoption of internationally approved principles, such as those in the 1997 UN Watercourses Convention, and the development of a cooperative framework at the national level can facilitate the establishment of more effective governance structures.

Furthermore, the importance of water diplomacy in fostering trust, and collaboration, and addressing broader political, social, and economic issues related to water management has been highlighted. Lessons from other river basins, such as the Mekong show that the involvement of civil society and the strengthening of regional organizations through external support can enhance cooperation and prevent conflicts over shared water resources.

The Mekong River Basin's experience offers valuable insights into the challenges and successes of such management, including the establishment of institutional frameworks, balancing competing demands, adaptation to climate change, and data sharing and joint monitoring. By learning from these experiences and best practices, other transboundary river basins, such as the Syr Darya River Basin, can enhance their water management strategies, promote regional cooperation, and ultimately contribute to the sustainable development and well-being of the people living in these regions.

In summary, addressing the challenges of water resource management in transboundary river basins requires a multifaceted approach that considers the complex interplay of political, social, and economic factors. By recognizing the differences and complementarities between transboundary water cooperation and water diplomacy, this thesis has offered insights into potential strategies for enhancing cooperation, promoting sustainable water management, and avoiding conflicts in the CA region and beyond.

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