

# GOVERNING SHARED WATER TO ACHIEVE THE SDGS: A CASE STUDY OF THE MEKONG RIVER, CHIANG KHONG DISTRICT, CHIANG RAI PROVINCE, THAILAND

Kornkanok Sanabud<sup>1\*</sup>, Wanwalee Inpin<sup>1</sup>, and Muhammad Anggri Setiawan<sup>2</sup>

<sup>1</sup> School of Social Innovation, Mae Fah Luang University, Thailand

<sup>2</sup> Faculty of Geography, Universitas Gadjah Mada, Indonesia

## ABSTRACT

**\*Corresponding author:**  
Kornkanok Sanabud  
6652301005@amduan.mfu.ac.th

**Received:** 27 November 2024

**Revised:** 18 May 2025

**Accepted:** 19 May 2025

**Published:** 19 June 2025

### Citation:

Sanabud, K., Inpin, W., & Setiawan, M. A. (2025). Governing shared water to achieve the SDGs: A case study of the Mekong River, Chiang Khong District, Chiang Rai Province, Thailand. *Humanities, Arts and Social Sciences Studies*, 25(2), 342–357. <https://doi.org/10.69598/hasss.25.2.274760>

Water is crucial for life, ecosystems, and economic activities, necessitating its equitable distribution and sustainable management to achieve the United Nations' Sustainable Development Goals (SDGs). SDG 6, "clean water and sanitation," includes specific emphasis on integrated water resources management (IWRM) and the protection and restoration of water-related ecosystems, which are mentioned in targets 6.5 and 6.6. Implementation of IWRM frameworks involving governments, local communities, and civil society is essential for effective shared water governance. This study examines the Mekong River Basin as a shared river basin that is exacerbated by rapid economic development and hydropower projects that reduce sediment flow, disrupting ecosystems and local livelihoods. The study utilized qualitative research, in which the data were collected by in-depth interviews with a purposive sampling method based on the Chiang Khong population's career sector and the relevant literature. It has been found that governance challenges in managing shared water resources include complex political dynamics and inadequate legal frameworks, and the absence of inclusive decision-making exacerbates tensions among riparian countries. Addressing these challenges requires a holistic approach that considers ecological, socio-economic, and political factors. Applying the concept of governing the commons to the Mekong Basin faces challenges, especially power imbalances and competing interests. However, it offers opportunities for cooperation and collective action. Stakeholders, including national governments, the private sector, NGOs, and local residents, play unique roles in promoting sustainable water management. This study advocates for a holistic approach to water governance, integrating ecological, socio-economic, and political considerations and emphasizes the roles of national governments, the private sector, NGOs, and local communities in promoting sustainable water management. Addressing the shared water issues requires multi-stakeholder collaboration to achieve the SDG targets and ensure the Mekong Basin's long-term water resource and ecosystem sustainability.

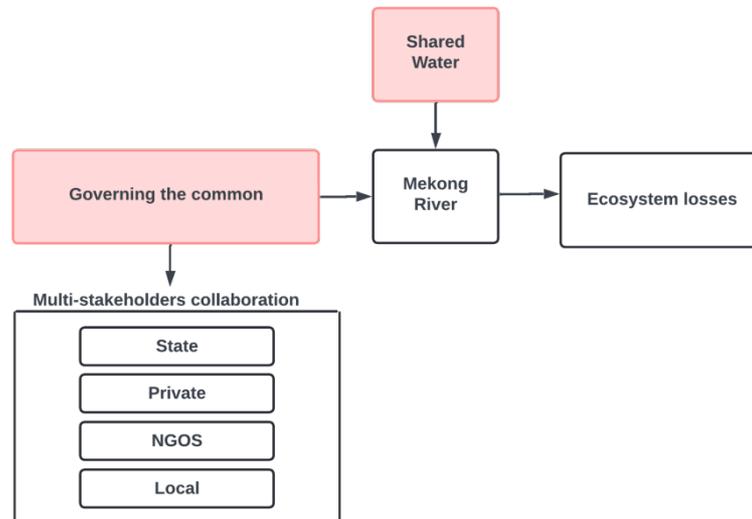
**Keywords:** Mekong River; shared water; governing the commons; multi-stakeholder collaboration

## 1. INTRODUCTION

Water is a crucial resource for human and non-human organisms; it is a main factor in sustaining ecosystems, human societies and economic activities. In 2015, the United Nations proposed the Sustainable Development Goals (SDGs) to highlight that our world's resources should be distributed equitably and managed sustainably. Water management was mentioned in SDG 6, clean water and sanitation, which aims to ensure the availability and sustainable management of water and sanitation for all. Under SDG 6, there are two targets related to water resources management. First, target 6.5 focuses on the implementation of integrated water resources management (IWRM) by 2030 at all levels, especially through transboundary collaboration. To achieve this target, to ensure water security for all, recognition of the transboundary nature of water resources and a call for partnership programs, research, and awareness-raising in order to assist integrated water resource management both locally and worldwide are required. Second, target 6.6 focuses on protecting and restoring water-related ecosystems, including mountains, forests, wetlands, aquifers, lakes and rivers, by 2030. This target highlights the importance of the preservation of the natural environment and biodiversity to ensure the sustainable provision of water resources and to support ecosystems that depend on water. Achieving target 6.6 calls for coordinated action by riparian nations in order to protect and restore transboundary water-related ecosystems. Cooperation in ecosystem preservation and restoration can be facilitated by shared water governance institutions, such as international agreements, cooperative management plans, and transboundary conservation projects. Cooperation across nations will help tackle shared environmental issues, protect biodiversity, and guarantee that ecosystem services will be provided with sustainability for both current and future generations. To effectively promote shared water governance, it is imperative to create IWRM frameworks that include all relevant stakeholders, namely the state, business, and non-governmental sectors, as well as local resident actors, as outlined in targets 6.5 and 6.6.

However, in many regions across the globe, water resources face increasing pressures due to population growth, urbanization, industrialization, and climate change. Nowhere is this challenge more evident than in transboundary river basins, where many countries share watercourses and must navigate complex governance dynamics to ensure water security and sustainability. This research delves into the intricate interplay between water governance and the pursuit of the SDGs by focusing on a compelling case study of the "shared water" in the Mekong River.

The Mekong River is a common resource where six countries in Asia (China, Myanmar, Laos, Thailand, Cambodia, and Vietnam) use this open resource together. The Mekong River serves as a lifeline for millions of people, supporting diverse ecosystems, agricultural production, fisheries, and hydropower generation. Therefore, the tragedy of the commons is more challenging when an individual nation has unregulated access to the shared water and consumes it for only their own benefit. This could lead to environmental degradation, which directly affects human life and the planet in the long term. Understanding the governance mechanisms and challenges in managing shared water resources in the Mekong River Basin is therefore crucial for advancing the sustainable development objectives. As Ostrom (1990) mentioned in "Governing the Commons," the tragedy of the commons is what we should avoid by providing the design principles for how the commons can be governed equitably and sustainably. This study aims to examine the essence of the common governance of shared water resources in order to achieve target 6.5 and 6.6 of the Sustainable Development Goals, and also, to examine how each stakeholder, including national organizations, the private sector, NGOs and local residents, respond to ecosystem losses in the shared water resources of the Mekong River. By adapting the eight principles from Ostrom for governing the commons, this study seeks to identify pathways for enhancing cooperation, promoting equity, and advancing sustainability objectives in order to prevent the tragedy of the commons in the Mekong River. Figure 1 shows the conceptual framework of this study.



**Figure 1:** Conceptual framework

The Mekong acts as a shared water source that provides life for millions of living species; however, since the construction of a series of dams in the mainstream were completed, along with the shift of global climate patterns or climate change, it is certain that the Mekong River is currently facing ecological losses due to the consequences of biological changes. One of the most harmful results occurs when the ecosystem cycle collapses negatively as a result of sediment losses. Due to this, the development of dam projects in the upper part of the Mekong mainstream is the main key factor that has put the ecosystems in the Mekong into danger. Sediment in this sense means the nutrition that contains the cycle of all living organisms in the Mekong River. When there is no nutrition in the river, the ecosystem and natural cycle will not function well. Therefore, to govern this common resource, the Mekong River, collaboration among multiple stakeholders is crucial to underscore the degree of importance of common resource management. To address and acknowledge the changes in this shared resource, especially the biological losses in the Mekong River Basin, fostering collaboration among stakeholders is highlighted in this study as progress towards achieving SDG targets 6.5 and 6.6 to ensure water security, ecosystem sustainability, and the well-being of communities that are dependent on the Mekong's resources.

## 2. LITERATURE REVIEW

### 2.1 Ostrom's principles on governing the commons

In the work of Elinor Ostrom on common pool resources, management requires rules, regulations and governance mechanisms in order to manage public resources that are unlimitedly available for everyone (Ostrom, 1990). Ostrom's design principles place a strong emphasis on the necessity of decentralized decision-making, well-defined property rights, and group action for sustainable resource management. Supplementary insights into the strategic interactions, power dynamics, and negotiating techniques among governments sharing water resources may be gained from other theoretical vantage points, such as game theory, hydropolitics, and hydro-diplomacy (Delli Priscoli, 1996; Zeitoun & Warner, 2006).

The concept of governing the commons has been a subject of policy debate, especially in the context of common resource management. According to Ostrom's work, the literature on governing the commons (1990) examines how communities and institutions regulate the use of shared resources to achieve sustainability and avoid the tragedy of the commons. She cited the concept of "Tragedy of the Commons" that was first introduced by Garrett Hardin (1968), which indicates a situation where many individuals over-use a shared common resource until it is expected to be depleted. Hardin (1968) stated that people always prioritize their own interests rather than common interests, and when populations are rapidly increasing, the common resources will inevitably deteriorate. In other words, to avoid the tragedy of the commons, there needs to be effective management and governance to have control over the common resource, especially laws and regulations. At the core of the governing of the commons, Ostrom's framework analyzed common pool resource management by identifying a set of design principles that characterize successful governance arrangements, including clearly defined boundaries, collective choice mechanisms, monitoring and sanctioning systems, and mechanisms for conflict resolution (Ostrom, 1990).

In terms of resource management, Ostrom (1990) found universal rules to explain why community resource management practices and resource users in different areas are successful, by understanding and identifying common institutional characteristics of the community, called “design principles” that consist of eight dimensions, which are as follows:

1. Clearly defined boundaries; there are two boundaries: the user boundary allows communities that successfully manage resources to be able to distinguish among themselves who has and who does not have rights to the resource. Additionally, a resource boundary indicates that those resources being managed have clear boundaries that can distinguish between the boundaries of the resource system that the community takes care of and the larger social ecosystem in society.

2. Congruence between appropriation and provision rules and local conditions; there are two parts: one is the consistency between the rules governing resource utilization and resource system maintenance and the social and environmental conditions in the area, and the second one is the consistency between the benefits that members will receive and the costs that they have invested.

3. Collective-choice arrangements allowing for the participation of most of the appropriators in the decision making process.

4. Effective monitoring by monitors who are part of or accountable to the appropriators; there are two parts: first, monitoring and supervising the behavior of resource utilization and maintenance of resource systems by resource users to ensure that they comply with the established rules, and the second part is monitoring the condition of the resources on a regular basis.

5. Graduated sanctions for appropriators who do not respect community rules; if surveillance finds offenders, the punishments for the first time will be relatively light, while the punishments for repeated offenders will be more severe.

6. Conflict-resolution mechanisms that are inexpensive and easy to access; communities that are successful in managing their resources have mechanisms for managing conflicts between users or users and government officials that are fast and cost-effective.

7. Minimal recognition of rights to organize; this is related to community-led management and localization in which governments allow communities to manage their own resources by themselves.

8. Organization in the form of multiple layers of nested enterprises, with small, local systems at their bases; resource management rules and management policies must be linked to a larger system. Since the resource system and resource management itself are situated and connected to a larger social ecosystem, the management system and rules must also be consistent with the larger system.

Ostrom’s design principles have been studied in a wide range of fields, such as fisheries, forests and rivers. They refer to the effective governance that incorporates the components of community-based management, co-management arrangements between stakeholders, and state-led regulation as governance mechanisms to achieve sustainable resource use and enhance livelihoods (Agrawal & Ostrom, 2001). There are common patterns, challenges, and success factors in governing common pool resources (Berkes, 2009). This helps to contribute contextual factors that influence governance outcomes and inform the design of more effective management strategies. In the work of Randhir (2016), who studied the impacts of globalization on local commons, it was found that without effective governance and clear regulations, globalization may intensify environmental harm. As a result, increasing the resilience of local commons through multi-scale policies and incentive systems is needed to enhance public participation. From this point of view related to the idea of property rights (Schlager & Ostrom, 1992), the focus is on the practicality of governing the commons by providing a ‘bottom-up’ approach to natural resource governance in order to centralize the relationships between various governmental actors. Nevertheless, the concept of Ostrom is flexible and has been utilized in water common-pool resources around the world, including in Nepal, Pakistan, Japan, Bulgaria and also Thailand. The key success of the application of Ostrom’s principles is related to social capital, group size and heterogeneity, and external interventions, as summarized by Gari et al. (2022).

Many scholars have debated the applicability of Ostrom’s design principles in various fields and empirical studies. Some of these scholars found that there are several limitations of community-based approaches in addressing larger-scale environmental problems (Cinner et al., 2012) that may cause exacerbated inequalities, exclude marginalized groups, and fail to address the broader social and ecological dynamics among involved actors (Leach et al., 1999). Moreover, the increasing globalization and commercialization of natural resources pose new challenges to traditional governance systems, which require more developed approaches to bring all stakeholders together, in both local and global scales (Armitage et al., 2009). The debate over governing the commons highlights the need for adaptive and context-specific solutions that integrate local knowledge, institutional diversity, and multi-level governance arrangements.

## 2.2 Political ecology

Since 1980, the political ecology has been an area of environmental criticism discussed among developing world countries with most of these discussions being linked to the issues of environmental degradation. Cockburn and Ridgeway (1979) indicate that political ecology can explain the social movements concerned with environmental issues in the USA and Western Europe as well as other industrialized countries aiming to alleviate the issues of environmental degradation in urban and rural areas resulting from wrongly implemented management by private and state actors. Blaikie and Brookfield (1987) shifted the meaning of political ecology to explain the relationship between social class and land management, which aims to reflect local choices and contexts. Greenberg and Park (1994) called for the need to link decentralization to productive activities and ecological goals in order to synthesize key issues regarding the relationships between human societies in terms of their biological, cultural, political and human imperative complexities. Watts (2000) identified the complexity of the relationship between environment and society by analyzing the power relations in terms of controlling and managing the resources. Political ecology is a critical theory in explaining and exposing environmental problems while trying to propose solutions as well as creating alternatives for solving these environmental problems.

When analyzing environmental problems, it is necessary to involve all stakeholders (Blaikie, 1985). Therefore, the study of social and environmental problems requires a people-centric approach by considering the diversity of thought as well as analyzing the discourse to see how environmental problems are socially constructed.

Bryant (1992) divided the research issues according to the framework of political ecology analysis into three components: (1) contextual sources of environmental change, (2) conflicts over resource access, and (3) political consequences resulting from environmental change. This research will focus mainly on (2), conflicts over resource access, due to this being a study of the relationships among access rights, local struggles and ecological transformation, which focuses on the constraints and opportunities that result in disadvantaged people in society fighting to protect the environment on which their livelihoods depend. The conflicts over resource access relate to property rights regimes that identify the right to control the benefits derived from resources. Therefore, a property rights regime is an important concept in political ecology because environmental problems are a conflict of rights for the benefit of each party. Garrett Hardin (1968) stated that overpopulation causes environmental problems because people will always prioritize their own interests, leading to the idea that resources and the environment as common property (common rights) will inevitably deteriorate. In other words, to avoid the tragedy of the commons requires good management and governance to control over the common resource especially law and regulations. Studies on the impacts of ecological politics, especially regarding the Mekong River, reveal the lowest water level in the past 100 years has possibly been caused by the upstream dam development (Eyler, 2020; Kallio & Fallon, 2020). Also, the consequences of its impact are linked to the issues of GMS border trade, migration, and human trafficking (Korwatanasakul & Durongkaverroj, 2022).

In terms of resource management, Ostrom (1990) attempted to find universal rules to explain why community resource management practices and resource users in different areas are successful by understanding and finding common institutional characteristics of the communities, referred to as design principles. This study applied the design principles of Ostrom (1990) to explain the situation of shared water problems in the Mekong River and analyze the importance of involved stakeholders in order to seek pathways for enhancing cooperation, promoting equity, and advancing sustainability objectives in order to avoid the tragedy of the commons in the Mekong River.

## 2.3 Shared water management

In relation to Ostrom's principles, the concept of shared water resources has become an important issue among academic and policy debates, especially in the context of transboundary river basins and water governance. Obviously, rivers are one of common resources that are frequently the target of competing interests, conflicts among stakeholders, and governance challenges. Therefore, the aim of this section is to examine the literature and debates of the shared water concept by shedding light on its implications for governing the shared water and collaboration among stakeholders.

The concept of shared water is underpinned by several scholars' perspectives that provide insights into the complexities of transboundary water governance. The shared water concept was adopted in various case studies relating to transboundary water, including the Nile River, Indus River and Mekong River basins. Among these studies, the analysis was related to the factors influencing cooperation and tensions over the water resources. Also, the effectiveness of institutional arrangements and the socio-economic and environmental impacts of transboundary water management initiatives were centered in the discussion (Wolf et al., 2003; Giordano et al., 2007). The work of Wolf et al. (2003) analyzes both successful cooperation, such as the Rhine River Commission, and conflict, such as the Israeli-Palestinian water dispute. He calls for greater

transboundary water cooperation, capacity building, and conflict prevention measures to mitigate the risks of water-related conflicts in an increasingly water-stressed world. One similar case study of shared water issues in Southeast Asia appears in the work of Magee and Kelley (2009), which mentions that Nu-Salween is extremely attractive from a hydropower development perspective. The Nu-Salween River has its headwaters in Tibet and flows through the Chinese province of Yunnan before entering Myanmar, where it forms the boundary with Thailand, and then flows into the Andaman Sea. In 1999, Tibet and Yunnan province were targeted for building infrastructure in the region under the Chinese Western Development Campaign. This point of view shows that Nu-Salween River as a shared river is also at risk from mega-development projects and a lack of water governance.

Comparative research on transboundary river basins provides insightful information about the importance of mutual reliance, shared advantages, and trust-building techniques for productive collaboration. Conversely, it is discouraged by historical disagreements, uneven power relations, and concerns about sovereignty (Dinar et al., 2015; Mirumachi, 2015). There are also some critics who argue that, in terms of water governance, the state-centric interests are given attention over the needs of local communities and ecosystems, which can lead to inequitable outcomes and environmental degradation (Zeitoun et al., 2016). Furthermore, the securitization of water resources has weakened hopes for peaceful collaboration and sustainable development by escalating tensions and inciting militaristic reactions, especially in areas that are prone to conflict (Hensengerth, 2015). The discussion on commodification and privatization of water resources highlight the inclusive and participatory approaches to water governance to ensure that all stakeholders can access use of water resources equitably (Bakker, 2010). In the design principles of Ostrom (1990), the importance of effective governance to manage common pool resources and avoid the overuse and degradation of water resources is highlighted. The eight principles of Ostrom also mention the importance of a participation structure in sustainable water resource management. By following Ostrom's principles in the case of the Mekong River, communities are encouraged to build resilience and effective systems for their common resources.

#### **2.4 Multi-stakeholder collaboration**

According to the eight principles of Ostrom, multi-stakeholder collaboration (MSC) is the process by which several stakeholders join together to address common concerns or achieve shared objectives. It is necessary to build the resource management mechanisms of the shared water by involving all stakeholders together. The MSC concept has been recognized as essential for addressing complex global issues, especially the shared resources that require being properly managed. The foundations of multi-stakeholder collaboration are rooted in (1) collaborative governance and (2) participatory decision-making. Collaborative governance was defined by Ansell and Gash (2008) as involving state actors directly engaged with non-state actors in a mutual decision-making process, which is aimed at reaching common goals and effective policy implementation. In order to enhance legitimacy and accountability in the policy making process, it is necessary to adopt the participatory governance which includes all stakeholders.

The concept of multi-stakeholder collaboration has been applied throughout various fields, including public health (Wouters, 2012), the business sector (Rasche & Waddock, 2014), and environmental management (Reed, 2008). However, partnership is the common context amongst the literature. The multi-stakeholder approach provides a platform where all stakeholders can share resources, coordinated responses, and policy development to tackle common concerns. When multiple stakeholders come together, they can provide ideas and viewpoints from different fields, which can ensure long term and more sustainable solutions (Reed, 2009). According to Gray (1989), this indicates that multinational corporations want to improve their ability to solve problems by leveraging a variety of resources and knowledge from different stakeholders. By involving all stakeholders in the decision-making processes, the policy acceptance and initiatives can be enhanced, but they should be based on increased regulation and trust (Ansell & Gash, 2008). Therefore, from this point of view, it can be clarified that trust building among multiple stakeholders fosters long-term cooperation.

The effectiveness and equity of multistakeholder collaboration has been debated amongst scholars, including Provan and Kenis (2008), who stated that a slow process in decision making was often found when combining various stakeholders together. However, successful case studies were more highlighted due to MSC providing more significant positive impacts by prioritizing the necessity of well-designed collaboration. Nevertheless, there is still some concern that without appropriate management, inequity will remain. Due to the power disparities of resources and influence, the results of decisions might be biased by more powerful stakeholders (Warner, 2006). For instance, in some environmental management projects, if the opinions of the local population, as one of the stakeholders, are not given equal weight as that given to more powerful groups, the results of the decisions will certainly benefit those who are more powerful.

In conclusion, MSC provides numerous benefits. However, it also results in significant challenges related to the problem of power dynamics. This ongoing debate highlights the need for proper design and management to ensure effectiveness and equitability. The success of MSC in the future will rely on its capacity to overcome these obstacles and make use of the many advantages held by each of the numerous stakeholders. Therefore, this study has adopted Ostrom's design principles as a framework to analyze the situation of the shared Mekong River that is faced with ecological losses due to the focus on personal rather than collective interests. It is thus crucial to highlight the importance of collaboration among all stakeholders in order to emphasize the common need and clear regulations for managing shared water resources in the most sustainable way.

### 3. RESEARCH METHODOLOGY

This study utilized a qualitative research approach to explore the governance of the Mekong River, which was identified as a shared water resource, and its relevance to the Sustainable Development Goals (SDGs) listed in target 6.5 and 6.6. The primary data was collected through in-depth interviews, focusing on key informants selected through a purposive sampling method based on their occupations and their connection to the Mekong River. The in-depth interviews were conducted in the field with 12 interviewees representing each stakeholder sector (Table 1), in which each sector has different involvement with the Mekong River. Therefore, it provides a very useful broader picture of the local management of the river and the participation of other stakeholders in managing the Mekong River, including the challenges and obstacles that each sector has encountered in terms of sustainable river management. In addition, the secondary data collection was conducted by a literature review of the relevant research and governmental reports.

The collected data was analyzed using a thematic approach that presents the shared water governance in the Mekong River Basin as well as at the level of Chiang Khong District. Importantly, the issues of ecological losses and the water quality are presented to identify the impact of the Mekong River changes and also the impacts of the management policies on local communities and the role of local governance in sustainable water resource management.

**Table 1:** Key informants' information and their involvement in the changes of the Mekong River

Key Informants	Occupation	Involvement with the Mekong River
Mayor of Wiang Chiang Khong Municipality	Governmental staff	Mekong River management policy and strategy
Deputy Mayor of Wiang Chiang Khong Municipality	Governmental staff	Mekong River management policy and strategy
Director of the Public Health and Environment Division of Wiang Chiang Khong Municipality	Governmental staff	Mekong River management policy and strategy
Hotel Owner A	Private business owner	Affected by the decline in tourism
Hotel Owner B	Private business owner	Affected by the decline in tourism
Restaurant Owner	Private business owner	Raw cooking materials are becoming rarer and more expensive
Director of Rak Chiang Khong Conservation Group	Local NGO	Working to serve as a platform to study and monitor changes caused by developments in the Mekong River Basin
Members of the Rak Chiang Khong Conservation Group	Local NGO	Daily sediment quality monitoring in the Mekong River
Living River Siam Association	Local NGO	Protecting river ecosystems and the rights of communities affected by large-scale water resource development
Head of riverweed OTOP group	Local resident	Affected by the decrease in the amount of riverweed due to the unstable ecosystem in the Mekong River
Head of Giant union	Local resident	Affected by the significant decrease in the number of fish
Bean sprout farmer	Local resident	Affected by unstable water levels that make it impossible to predict planting times

## 4. RESULTS AND DISCUSSION

### 4.1 Shared water governance in the Mekong River Basin

Shared water governance in the Mekong River Basin is characterized by the complex political, economic, and social dynamics among riparian countries. The absence of a comprehensive legal framework for transboundary water management has led to unilateral development projects, such as hydropower dams, without adequate consideration of downstream impacts. Furthermore, existing governance structures, such as the Mekong River Commission (MRC), face limitations in enforcing agreements and resolving disputes among member states. The lack of inclusive and participatory decision-making processes further exacerbates tensions and undermines cooperation for sustainable water management.

Applying Ostrom's principles to the Mekong River Basin can clarify the governance challenges and opportunities. There are eight principles under Ostrom's governance as follows.

1. Clearly defined boundaries: establishment of clear boundaries through international agreements that define each country's rights and responsibilities regarding water use. For example, regarding international institutions such as the MRC, there must be clear regulations on who has the right to use the resources in the Mekong River, and in each season which stakeholder should be prioritized to use the resources in the Mekong River first, with regulations derived equally from all stakeholders.

2. Congruence between appropriation and provision rules and local conditions: creating rules that continually address the needs of stakeholders in every sector such as agriculture, fishing, and hydropower. The rules should reflect the seasonal and geographic conditions in terms of water availability to promote sustainable practices. For example, any joint regulation should be based on sufficient resources of manpower, materials, and budget in order to ensure policy continuity.

3. Collective-choice arrangements: all stakeholders should be involved starting from the state level to local communities and indigenous groups, in decision-making processes. This can be done through platforms such as the Mekong River Commission (MRC), where member countries are required to set water management guidelines. Moreover, those who are affected by the Mekong changes should be included in the modification of these rules.

4. Monitoring: an early warning system and/or water quality monitoring system should be implemented to measure the flow levels and ecosystem health in the basin. Also, data should be shared among all members countries in order to ensure transparency and enable informed decision-making.

5. Graduated sanctions: a sanction system should be developed for non-compliant actors with agreed-upon rules, tailored to the severity and context of the violations. This could involve diplomatic negotiations, fines, or restrictions on certain types of water use.

6. Conflict-resolution mechanisms: the Mekong River is a common resource shared among various countries in the region. Therefore, conflicts between member countries are normal and will likely occur, but any action that goes beyond the agreement should be prevented by establishing mechanisms for resolving disputes over water use and management. The MRC and other regional organizations can play a key role in facilitating these processes.

7. Minimal recognition of rights to organize: the right of local communities in managing the river should be recognized. Also, traditional water management practices should be respected so as to ensure that local voices are heard in broader governance discussions.

8. Nested enterprises: multi-level governance that coordinates water management efforts at multiple levels should range from local communities to international bodies.

### 4.2 Ecological losses and water quality issues

The construction of hydropower dams in the upper Mekong basin has altered the natural flow regime and sediment dynamics of the river, resulting in the "hungry water" effect downstream. Reduced water flow and sediment load have led to habitat degradation, loss of biodiversity, and disruptions to ecosystem services in the Mekong Delta and other downstream areas. Fisheries, agriculture, and navigation are particularly vulnerable to the impacts of "hungry water," threatening the livelihoods and food security of millions of people dependent on the river's resources.

The planning of dam construction without any environmental concerns and a lack of disaster mitigation is impacting the local communities. Importantly, Dam development projects were planned in the upper part and became a serious concern in the lower part. The upstream Mekong development has led to significant maintenance of sediments and nutrients (Kummu & Sarkkula, 2008) and could damage the socio-ecological system. The Chiang Khong community were also among the first to report unusual changes in the river as it was drying up excessively with a severe threat of algae blooms. When the river water clarity remains high, the algae bloom increasingly causes a bad smell of green mats, destroying traditional fisheries and leading to environmental deprivation and loss of livelihoods.

“The Mekong River is not a river but the life of Chiang Khong people;” this is a message from Kru Tee, the head of Mekong School who works actively to protect the Mekong River from dam development. He also mentions, “During the last 20 years, the Chinese government has constructed the dams and controlled the river in the upper part leading to the lower part facing the extreme rising and falling of the river in unusual ways and cutting the natural circle of life” (Head of the Mekong School Organization, personal communication, January 9, 2022).

Therefore, the presence of the dams has disrupted the environmental security in the Mekong River communities and corresponds with the destruction of the cycle of all living organisms. In the socio-ecological system, the interaction between people and nature, the ecosystem provides food to people and animals as ecosystem services, so it is crucial to consider that when the dam development is completed, the ecological system will be changed, which will have an impact on human security.

Most people in the affected areas are in the agricultural sector and rely on rivers as their main source of income. Due to the current situation of the Mekong River, unnatural flows create significant issues for the local communities along the Mekong River including extreme drought and flooding, lack of sediment transport and loss of biodiversity, especially fish and riverweed.

“Normally, before China built dams, women farmers usually harvested ‘kai’ (riverweed in the Mekong River) as our main income. Per year (with a harvest season in around Jan-Mar during the dry season), the income increased to more than 30,000 Thai baht. Compared to the past, we could collect ‘kai’ more easily than nowadays because when China releases water, we cannot find ‘kai’ because the level of the Mekong River is too high.”

The statement above is from a ‘kai’ farmer who harvests it as her main source of income. Obviously, in this context of women farmers, the consequences of dam development on the Mekong River is one of the threats that prevent people from gaining an income by doing their job (Union member of Kai (riverweed) OTOP, personal communication, January 9, 2022).

**Table 2:** Summary of interviewees on the responses to ecological changes

Stakeholders	Responses
Wiang Chiang Khong Municipality	<ol style="list-style-type: none"> <li>1. Developing a community plan to respond to environmental changes</li> <li>2. Installing CCTV cameras to monitor abnormal fluctuations in water levels</li> </ol>
Private business owners	<ol style="list-style-type: none"> <li>1. Reducing labor force and staff</li> <li>2. Increasing food prices</li> <li>3. Exchanging information with the Laos side to conduct tour programs</li> </ol>
Local NGOs	<ol style="list-style-type: none"> <li>1. Coordinating cooperation with civil society partners to participate in the formulation of development guidelines at the local, national, and regional levels in the Mekong River Basin.</li> <li>2. Organizing the community to build local resiliency through research, training programs, public communication, and policy advocacy.</li> </ol>
Local residents	<ol style="list-style-type: none"> <li>1. Riverweed farmers; buying riverweed from Laos and processing it into OTOP products.</li> <li>2. Fishermen; changing their occupation from a fishing career to general labor, gardener, etc.</li> <li>3. Bean sprout farmer; reducing dependence on the Mekong River and turning to alternative methods for growing bean sprouts instead.</li> </ol>

From the interview results as shown in Table 2, each sector responded differently to the Mekong River changes. However, responding to environmental changes at the local level alone cannot meet the needs of the affected people because completely changing occupations or reducing dependence on the Mekong River is not a solution to the root cause of the problem. Therefore, governance is vital to meet target 6.5 (integrated water resource management) and target 6.6 (protection of water ecosystems). By involving all stakeholders in the governance process, it is ensured that water resources are managed sustainably and benefit both current and future generations.

#### 4.3 Multi-stakeholder collaboration on the Mekong River

Ostrom’s principles of governing the commons exemplifies community-based resource management and calls for collective action for sustainability. However, applying this concept to the Mekong River Basin presents challenges in various dimensions, including the scale, complexity, and diversity of the involved stakeholders. One of the primary challenges is the ‘tragedy of the commons’ that will occur when overpopulation arises and resources are consumed for their self-interest without common concern. This may

degrade the important resources of the shared river, especially the sediment, riverweed and fish, until the natural cycle collapses. However, in contrast, without effective governance mechanisms, especially the eight principles of Ostrom (1990), users may prioritize short-term gains over long-term sustainability. The worst case scenario is that conflict among stakeholders will occur and gradually lead to tensions among member states.

From this perspective, collaboration among stakeholders in the Mekong River Basin is essential for addressing these challenges and promoting sustainable development. This collaboration involves a diverse range of actors, including national governments, the private sector, non-governmental organizations (NGOs), and local residents. Each stakeholder plays a unique role in contributing to solutions that balance economic development with environmental conservation and social equity.

#### **4.3.1. National governments**

Strengthening collaboration through regional structures, especially the Mekong River Commission (MRC), is necessary to improve transboundary cooperation among riparian nations in the Mekong basin. There are two main regional institutions working on the Mekong River Basin and on development of the region, which are the Greater Mekong Subregion (GMS) Cooperation and the Mekong River Commission (MRC). First, the GMS is a national economic area of the Mekong River Basin in Southeast Asian countries, covering 2.6 million square kilometers and a combined population of around 326 million with 65% comprising an active labor force. The GMS is one of the most biodiverse areas globally, abundant with diverse native and migratory species. The basin is rich with a diversity of freshwater river fauna, with nearly 500 species of fish that provide a large variety of fisheries as the second largest and the most significant in the world after the Amazon River (Mekong River Commission, 2004).

The Mekong River Commission (MRC) was established in 1995 with the aim of ensuring effective development of the Mekong River that benefits all member states and also aims to reduce threats to human and environmental insecurity. Areas of cooperation include irrigation, hydropower, navigation, flood control, and fisheries (Mekong River Commission, 2018). The Commission is tasked with ensuring sustainable development throughout the basin, and thereby focuses on reducing environmental harm and protecting, conserving, and even improving the surrounding areas of the region (Ha, 2011). On the other hand, Ha (2011) and Haefner (2023) argue that both the GMS and the MRC should extend their scope beyond economic development to environmental issues only. The MRC's mission to manage the environment considers sustainable development, and responses to environmental issues are entirely dependent on the character and personality of the MRC's leaders. The institution itself has not been able to overcome and institutionalize actual environmental and social factors beyond the discourses in its reports. Therefore, the MRC is seen as a knowledge organization that has failed to achieve its objectives. Despite their significant contribution to regional security, neither the MRC nor the GMS is seen as a security community, as neither regional institution has been able to achieve its own goals, which are to create a stable and civil environment and alleviate the water management problems peacefully under appropriate conditions (Schmeier, 2009). Therefore, the future of the Mekong River Basin depends on cooperation (Chheang, 2010) and the development of regional institutions.

Thus, national governments should commit to transparent information sharing, joint decision-making, and coordinated action to address shared water challenges. In addition, coordination of laws and policies pertaining to environmental protection and the management of water resources, which calls for the integration of water-related targets into national development strategies as well as cross-sectoral cooperation, is required. The most important goal to achieve is commitment to sustainable development. Governments should give top priority to achieving the SDGs, which include social justice, economic success, and environmental conservation. This means investing in green infrastructure, promoting the use of renewable energy sources, and ensuring that all parties are included in inclusive decision-making processes.

#### **4.3.2. Private sector**

The private sector, especially hydropower companies, has a responsibility to reduce environmental impacts and mitigate the impacts of dam construction on local communities and ecosystems. This includes the implementation of best practices in environmental management, stakeholder engagement, and benefit sharing, which should be subject to the regulations set by the governments. The Mekong Subregion is one of the most economically driven regions, as a hub for trade, commerce, culture, and training of high-quality human resources, especially in Vietnam (Kim & Thuc, 2020). Therefore, participation in public-private partnership (PPP) projects in the Mekong Subregion is essential as PPPs can be highly effective due to high-quality economic development. In addition, PPPs can provide good quality health care services to the people of the Mekong Subregion (Duc et al., 2012). In terms of economic development in the Mekong Subregion, PPPs seem to be successful in involving the private sector in public services, but strengthening public-private partnerships

should establish direct and regular channels of communication between the private sector and the governments within the Mekong Subregion (Mueller, 2009). In terms of infrastructure development in the Mekong Subregion, the Asian Development Bank (ADB) has promoted PPPs as a useful tool to leverage the private sector, diversify risk, and mobilize funds for infrastructure development (Open Development Mekong, 2015). PPPs also play an important role in strengthening the regulation of water and wastewater services in the Mekong River Basin (The Development Dimension, 2020). This is because in the agricultural sector, the private sector can promote innovative technologies to improve water quality in the Mekong River Basin and facilitate initiatives to reduce water demand. From this perspective, it is important to understand how new private sector-initiated technologies can benefit smallholder farmers. The International Fund for Agricultural Development (IFAD) states that there are new technologies that smallholder farmers can use to adapt to the consequences of climate change and prevent disasters affecting their livelihoods, using salinity monitoring technologies created through PPP projects (IFAD, 2021).

#### **4.3.3. Non-governmental organizations (NGOs)**

In terms of campaigning and awareness-raising, NGOs play a key role in raising awareness about the environmental and social impacts of mainstream Mekong dam development and in supporting policy changes towards sustainable solutions. They can mobilize public support, conduct research, and provide technical assistance to communities and governments. They can also build the capacity of local communities and civil society organizations to participate in decision-making processes and monitor environmental changes, empowering local stakeholders to build resilience and adaptability to the shared consequences of water development projects. Importantly, NGOs can facilitate multi-stakeholder platforms and collaborations that bring together government agencies, the private sector, and local communities to share knowledge, exchange best practices, and jointly develop solutions for sustainable water management.

In terms of environmental conservation, NGOs play an important role through fieldwork, such as providing environmental information to support environmental cooperation, conducting environmental research, and promoting cooperation among basin countries (Yun et al., 2017). Furthermore, Yusuda (2014) stated that currently, local people are prevented from fully participating in water management and playing a key role in supporting strategies and becoming agents of change in environmental management in the Mekong region. NGOs are a stakeholder group (Hirsch, 2010) that voice concerns about environmental issues and dam construction while also expanding networks to act in the social and political arenas of the region. The implementation of civil society networks for sustainable development (NGOs + communities) is important because they help communities along the Mekong River to have a voice and participate in decision-making. Their efforts range from advocating for sustainable river management to empowering communities to participate in decision-making processes related to environmental conservation. For example, the Mekong Youth Assembly (MYA) network specifically engages youth in the Mekong River region to promote environmental conservation and social justice. They encourage youth to actively participate in policy-making and environmental conservation initiatives. There is also Mekong Watch, an NGO working in the Mekong River region to promote environmental conservation and sustainable development. They focus on issues such as forest conservation, biodiversity protection, and community empowerment, especially in areas affected by dam development projects.

#### **4.3.4. Local residents**

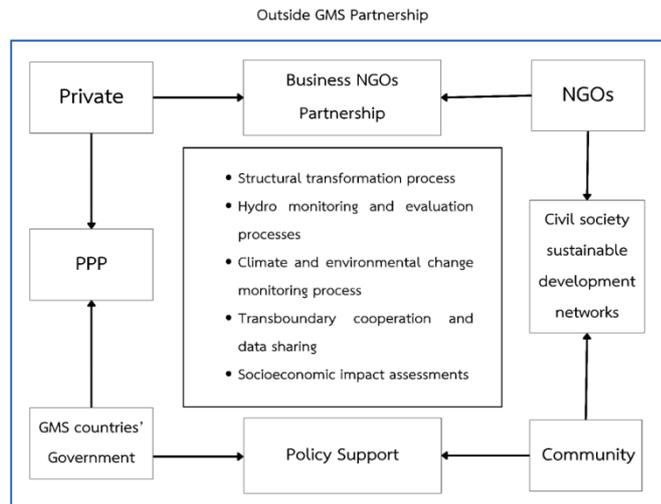
Local people are directly affected by changes in water flow, sediment dynamics, and ecosystem health. Their traditional knowledge is a valuable for sustainable resource management. Engaging local people in decision-making processes and incorporating their perspectives into governance frameworks is essential to ensure that their voices are heard. Investing in education can also reduce poverty and promote human well-being, in terms of empowering local people to monitor water quality and biodiversity, and fostering a sense of ownership and responsibility for natural resources.

Importantly, government policy support is also essential, using a top-down approach where the government plays a key role in promoting sustainable environmental policies for local communities along the Mekong River. This aims to fill the gaps in political instability that prevent local people from participating in politics. This collaboration includes community participation in policy-making, aligning local priorities with national policies, implementing the SDGs, and allocating resources and support mechanisms. This collaboration not only enables public participation, but also relies on and enhances good governance processes such as transparency and accountability. In the context of the Mekong Subregion, fostering community-government partnerships is essential, as policies that integrate local knowledge can support more inclusive and sustainable development. Efforts to strengthen cooperation between communities and governments within the Mekong Subregion can therefore lead to policies that are more responsive to the people living in the region.

## 5. DISCUSSION

In the transboundary river basins, especially in Mekong River case study, the governance mechanisms represent a critical challenge due to wide range of stakeholders who are involved. It is more challenging when combined with stakeholders that prioritize their own interests rather than common interests, which is relating to power dynamics. This research defined the Mekong River as a shared water resource, the border of which is shared among China, Myanmar, Laos, Thailand, Cambodia, and Vietnam. Due to the series of dam developments in its mainstream, the Mekong River faces significant challenges which harm the natural flow of the river as well as the sediment transport, leading to the issues of ecological losses and the collapse of the ecological cycle. For this reason, it is necessary to further enhance multi-stakeholder collaboration among the Mekong's riparian countries.

Given this complexity, it is essential to strengthen multi-stakeholder collaboration for shared water governance through the design principles of Ostrom. To apply these design principles, the Mekong River could be governed by balancing the needs of all stakeholders while preserving the ecological cycle and natural free flow of the river. This study found that there are some gaps in collaboration due to the main focus being on economic-centric and state-centric concerns. Therefore, multi-stakeholder collaboration in the Mekong Basin should be transformed beyond the state-level stakeholders by involving various actors through a wide range of partnerships, including: (1) business-NGOs partnerships (private sector + NGOs), (2) civil society sustainable development networks (NGOs + communities), (3) policy support (communities + GMS countries' governments) and public-private partnerships (PPP) (private sector + GMS countries' governments). Among these stakeholders, transforming the focus from economic to environmental goals necessitates five actions (Figure 2).



**Figure 2:** Environmental conservation partnership model

(1) The process of structural transformation is very important due to policy reformation and water governance being the main keys in prioritizing environmental sustainability in the Mekong River Basin. Governments might implement regulations to encourage eco-friendly practices, especially by setting a standard of action that allows the Mekong River to flow naturally as well as conservation of ecosystems and biodiversity by setting up protected areas, restoring degraded habitats, especially those of reared fish species, and promoting sustainable water-use practices to preserve biodiversity in the Mekong. Moreover, at the regional level, the environmental standards must be established by revising the 1995 Mekong Agreement to include binding environmental protocols to set the minimum flow standard requirement and sediment load proportion. This aims to ensure that the seasonal flow of the Mekong River remains stable.

(2) Hydro monitoring and evaluation processes that involve systematic observation and assessment are crucial for sustainable water management. In order to preserve the ecological health of the Mekong River and make effective choices in this cooperation, the shared data platform through which all stakeholders can report water levels, sediment transportation assessments, and concerns in their area should be developed. Also, more data and information could be provided through monthly and annual reports that include real-time river flow information and discharge rates from hydropower dams and ecological indicators. Based on this approach, there could be an extension to an early warning system by partnering with the private sector to

install upstream and downstream water level sensors and rainfall monitoring stations linked via satellite or GSM networks.

(3) Climate and environmental changes monitoring process: a multifaceted strategy should be used in the monitoring process to fully understand and cope with the effects of these changes. It is important to conduct regular monitoring and assessments of climate-related and environmental changes in the Mekong region in order to make well-informed decisions, formulate policies, and create adaptable strategies to deal with the difficulties presented by climate change. This process requires data collection, indicators, monitoring and assessment. To meet these requirements, partnership between key stakeholders is needed.

(4) Transboundary cooperation and data sharing: the Mekong's ecosystems and biodiversity are interconnected, and changes in one area can impact other areas downstream. Therefore, multistakeholder partnership is one of the crucial platforms that allow partners from different fields to participate in data sharing from their own expertise which aims to preserve the river's ecosystems and protect biodiversity.

(5) Socioeconomic impact assessments are conducted to understand the consequences of projects, policies or any changes relating to the well-being, livelihoods, and communities of the region. Therefore, conducting public hearings to gain a consensus and insights from local community members in the vulnerable zones of development projects, especially hydropower dams, is essential as this plays a vital role in ensuring that those implemented policies are inclusive and the needs of all stakeholders are prioritized.

These proposed partnerships align with the theoretical frameworks of shared water governance, governing the commons, and multi-stakeholder collaboration, offering action pathways for managing a complex transboundary resource such as the Mekong. Effective governance of common-pool resources requires inclusive, evidence-based, and participatory processes that mitigate power imbalances, equitably distribute benefits, and support long-term sustainability.

## 6. CONCLUSION

Water is essential for life in both human and non-human ecosystems. Therefore, achieving its equitable distribution and sustainable management should be prioritized for realizing the United Nations' Sustainable Development Goals (SDGs). In this research, the focus was mainly on SDG 6, clean water and sanitation, under which there are two targets related to water resource management and governance, targets 6.5 and 6.6. In target 6.5, the aim is to implement integrated water resources management (IWRM) by emphasizing collaboration among stakeholders at all levels. Furthermore, target 6.6 focuses on protecting and restoring water-related ecosystems by highlighting the importance of preserving natural environments to ensure water security.

Implementing IWRM frameworks by involving multiple stakeholders is essential for effective shared water governance. Achieving target 6.6 requires collaborative efforts among Mekong member countries to conserve and restore water-related ecosystems. Also, mechanisms such as international agreements can facilitate cooperation in ecosystem protection. The governance of shared water resources, particularly in transboundary river basins such as the Mekong River Basin, is a challenge due to the involvement of multiple stakeholders with diverse interests and power dynamics.

Analyzing governance in the Mekong Basin using Ostrom's principles for commons governance reveals an opportunity as well as challenges. Applying Ostrom's principles (1990) to the Mekong Basin highlights both governance challenges and opportunities. The principles emphasize the importance of clearly defined boundaries, collective-choice arrangements, and robust monitoring and conflict resolution mechanisms. However, there are gaps in collaboration, with the main focus often being on economic and state security rather than environmental sustainability.

To address these gaps, multi-stakeholder collaboration in the Mekong Basin should move to state-level actors and involve a wider variety of stakeholders through diverse types of partnerships, including business-NGOs partnerships, civil society sustainable development networks, policy support, and public-private partnerships by following the key actions needed to transform the economic focus toward environmental sustainability, including structural transformation processes, hydro monitoring and evaluation, climate and environmental change monitoring, transboundary cooperation and data sharing, and socioeconomic impact assessments.

## ACKNOWLEDGEMENTS

We would like to express our gratitude to the Postgraduate Scholarship for Tuition Fees from Mae Fah Luang University as well as the School of Social Innovation, Mae Fah Luang University, for their support and

guidance throughout this research project. Their insights and feedback have been helpful in shaping the scope and directions of this study. We are also grateful to all research participants involved in this research project for the valuable perspective, experience and knowledge, which made the study possible.

Finally, this research may not have been successful if there was a lack of inspiration, which is our Mekong River. The authors always keep in mind that the Mekong River is life. Sustainable river management and water governance is vital to restoring a healthy life to the river and all creatures that depend on it. We extend our gratitude to all for your invaluable contributions that significantly enhanced the quality of this paper.

## REFERENCES

- Agrawal, A., & Ostrom, E. (2001). Collective action, property rights, and decentralization in resource use in India and Nepal. *Politics & Society*, 29(4), 485–514. <https://doi.org/10.1177/003232920102900400>
- Ansell, C., & Gash, A. (2008). Collaborative governance in theory and practice. *Journal of Public Administration Research and Theory*, 18(4), 543–571.
- Armitage, D., Marschke, M., & Plummer, R. (2009). Adaptive co-management and the paradox of learning. *Global Environmental Change*, 19(1), 14–24. <https://doi.org/10.1016/j.gloenvcha.2008.11.001>
- Bakker, K. (2010). *Privatizing water: Governance failure and the world's urban water crisis*. Cornell University Press.
- Berkes, F. (2009). Evolution of co-management: Role of knowledge generation, bridging organizations and social learning. *Journal of Environmental Management*, 90(5), 1692–1702. <https://doi.org/10.1016/j.jenvman.2008.12.001>
- Blaikie, P. (1985). *The political economy of soil erosion in developing countries*. Routledge. <https://doi.org/10.4324/9781315637556>
- Blaikie, P., & Brookfield, H. (1987). *Land degradation and society*. Routledge.
- Bryant, L. R. (1992). Political ecology: An emerging research agenda in Third-World studies. *Political Geography*, 11(1), 12–36. [https://doi.org/10.1016/0962-6298\(92\)90017-N](https://doi.org/10.1016/0962-6298(92)90017-N)
- Chheang, V. (2010). Environmental and economic cooperation in the Mekong region. *Asia Europe Journal*, 8(3), 359–368.
- Cinner, J. E., Daw, T., & McClanahan, T. R. (2012). Socioeconomic factors that affect artisanal fishers' readiness to exit a declining fishery. *Conservation Biology*, 26(5), 1–7. <https://doi.org/10.1111/j.1523-1739.2012.01924.x>
- Cockburn, A., & Ridgeway, J. (1979). *Political ecology*. Times Books.
- Delli Priscoli, J. (1996). The evolution of principles and practices in international water resources management. *Water International*, 21(2), 96–104.
- Dinar, S., Katz, D., & De Stefano, L. (2015). *International water treaties: Negotiation and cooperation along transboundary rivers*. Routledge.
- Duc, H. A., Sabin, L. L., Cuong, L. Q., Thien, D. D., & Feeley, R. (2012). Potential collaboration with the private sector for the provision of ambulatory care in the Mekong region, Vietnam. *Global Health Action*, 5(10126), Article 10126. <https://doi.org/10.3402/gha.v5i0.10126>
- Eyler, B. (2020). *2020 status of Lower Mekong Mainstream and tributary dams* [Infographic]. Stimson. <https://www.stimson.org/2020/2020-status-of-lower-mekong-mainstream-and-tributary-dams/>
- Gari, R. S., Newton, A., Icely, J. D., & Delgado-Serrano, M. M. (2022). An analysis of the global applicability of Ostrom's design principles to diagnose the functionality of common-pool resource institutions. *Sustainability*, 9(7), Article 1287. <https://doi.org/10.3390/su9071287>
- Giordano, M., Giordano, M. A., & Wolf, A. T. (2007). The geography of water conflict and cooperation: Internal pressures and international manifestations. *Geographical Journal*, 168(4), 293–312.
- Gray, B. (1989). *Collaborating: Finding common ground for multiparty problems*. Jossey-Bass.
- Greenberg, J. B., & Park, T. K. (1994). Political ecology. *Journal of Political Ecology*, 1(1), 1–12. <https://doi.org/10.2458/v1i1.21154>
- Ha, M.-L. (2011). The role of regional institutions in sustainable development: A review of the Mekong River commission first 15 years. *Consilience: The Journal of Sustainable Development*, 5(1), 125–140. <https://doi.org/10.7916/consilience.v0i5.4436>
- Haefner, A. (2023). Water governance in the Mekong region: The role and impact of civil society organizations. *Water International*, 49(3–4), 310–317. <https://doi.org/10.1080/02508060.2024.2321777>
- Hardin, G. (1968). The tragedy of the commons. *Science*, 162(3859), 1243–1248. <http://www.jstor.org/stable/1724745>

- Hensengerth, O. (2015). Environmental security and transboundary water politics in the Greater Mekong Subregion. *Environmental Politics*, 24(4), 607–626.
- Hirsch, P. (2010). The changing political dynamics of dam building on the Mekong. *Water Alternatives*, 3(2), 312–323.
- IFAD. (2021, November 11). *Public-private partnerships accelerate climate change adaptation in Viet Nam*. <https://www.ifad.org/en/web/latest/-/ppp-viet-nam>
- Kallio, M., & Fallon, A. (2020, April 28). *CRITICAL NATURE: Are China's dams on the Mekong causing downstream drought? The importance of scientific debate*. Resource politics, Critical Nature, Chulalongkorn University. <https://www.csds-chula.org/publications/2020/4/28/critical-nature-are-chinas-dams-on-the-mekong-causing-downstream-drought-the-importance-of-scientific-debate>
- Kim, S.-Y., & Thuc, L. D. (2020). Sustainable location selection for investing in public–private partnership infrastructure projects: From a developing country's perspective. *Sustainability*, 12(15), Article 5914. <https://doi.org/10.3390/su12155914>
- Korwatanasakul, U., & Durongkaveroj, W. (2022). Water politics in the Greater Mekong Subregion: Implications and challenges on Thailand's border trade and inbound labour immigration. In B. Chellaney & F. Kliem (Eds.), *The displaced: disrupted trade, labour, and politics in the Mekong River Basin* (pp. 256–281). The Konrad-Adenauer-Stiftung's Regional Economic Programme Asia (SOPAS).
- Kummu, M., & Sarkkula, J. (2008). Impact of the Mekong River flow alteration on the Tonle Sap flood pulse. *Ambio*, 37(3), 185–192.
- Leach, M., Mearns, R., & Scoones, I. (1999). Environmental entitlements: Dynamics and institutions in community-based natural resource management. *World Development*, 27(2), 225–247. [https://doi.org/10.1016/s0305-750x\(98\)00141-7](https://doi.org/10.1016/s0305-750x(98)00141-7)
- Magee, D., & Kelley, S. (2009). Damming the Salween River. In F. Molle, P. Sookhem, T. Foran, & M. Käkönen (Eds.), *Contested waterscapes in the Mekong Region* (pp. 115–140). Earthscan.
- Mekong River Commission. (2004). *MRC annual report 2004*. <https://www.mrcmekong.org/publications/mrc-annual-report-2004/>
- Mekong River Commission. (2018). *MRC annual Mekong flood report 2015*. <https://www.mrcmekong.org/publications/annual-mekong-flood-report-2015/>
- Mirumachi, N. (2015). *Transboundary water politics in the developing world*. Routledge.
- Mueller, S. (2009). Institutional Quality and Competitiveness in the Greater Mekong Subregion. In *United Nations Economic and Social Commission for Asia and the Pacific, Studies in trade and investment 66. Impact of trade facilitation on export competitiveness: A regional perspective* (pp. 89–120). United Nations Publication. <https://hdl.handle.net/20.500.12870/360>
- Open Development Mekong. (2015, February 6). *Hydropower dams*. [https://opendevlopmentmekong.net/topics/hydropower/#\\_edn3](https://opendevlopmentmekong.net/topics/hydropower/#_edn3)
- Ostrom, E. (1990). *Governing the commons: The evolution of institutions for collective action*. Cambridge University Press.
- Provan, K. G., & Kenis, P. (2008). Modes of network governance: Structure, management, and effectiveness. *Journal of Public Administration Research and Theory*, 18(2), 229–252.
- Randhir, T. O. (2016). Globalization impacts on local commons: Multiscale strategies for socioeconomic and ecological resilience, *International Journal of the Commons*, 10(1), 387–404. <https://doi.org/10.18352/ijc.517>
- Rasche, A., & Waddock, S. (2014). Global Sustainability governance and the UN global compact: A rejoinder to critics. *Journal of Business Ethics*, 122(2), 209–216.
- Reed, M. S. (2008). Stakeholder participation for environmental management: A literature review. *Biological Conservation*, 141(10), 2417–2431.
- Reed, M. S. (2009). Who's in and why? A typology of stakeholder analysis methods for natural resource management. *Journal of Environmental Management*, 90(5), 1933–1949.
- Schlager, E., & Ostrom, E. (1992). Property-rights regimes and natural resources: A conceptual analysis. *Land Economics*, 68(3), 249–262. <http://dx.doi.org/10.2307/3146375>
- Schmeier, S. (2009). Regional cooperation efforts in the Mekong River Basin: Mitigating river-related security threats and promoting regional development. *ASEAS*, 2(2), 28–52.
- The Development Dimension. (2020). *Innovation for water infrastructure development in the Mekong Region*. [https://www.mekonginstitute.org/uploads/tx\\_ffpublication/Innovation\\_for\\_water\\_infrastructure\\_in\\_Mekong\\_region\\_updated.pdf](https://www.mekonginstitute.org/uploads/tx_ffpublication/Innovation_for_water_infrastructure_in_Mekong_region_updated.pdf)
- The United Nations. (2015). *Sustainable development goals*. <https://documents.un.org/doc/undoc/gen/n15/291/89/pdf/n1529189.pdf?token=As84W4JzjvkFWglwU&fe=true>

- Warner, J. (2006). More sustainable participation? Multi-stakeholder platforms for integrated catchment management. *International Journal of Water Resources Development*, 22(1), 15–35.
- Watts, M. (2000). Political ecology. In E. Sheppard & J. T. Barnes (Eds.), *A companion to economic geography* (pp. 257–274). Blackwell.
- Wolf, A. T., Kramer, A., Carius, A., & Dabelko, G. D. (2003). *Managing and transforming water conflicts*. Cambridge University Press.
- Wouters, E., (2012). Multistakeholder partnerships in global health: The case of HIV/AIDS. *Social Science & Medicine*, 74(4), 502–509.
- Yun, G., Williams, S., & Wenbin, D. (2017). Water management of the Mekong River. *Malaysian Journal of Sustainable Agriculture*. 1(2). 15–17. <https://doi.org/10.26480/mjsa.02.2017.15.17>
- Yusuda, Y. (2014). *Formal rules, informal norms and advocacy strategies of NGOs: Lessons from the Mekong River (Research Brief Series No. 1)*. Centre for Water Law, Policy and Science, University of Dundee. <https://doi.org/10.13140/RG.2.1.1317.5848>
- Zeitoun, M., & Warner, J. (2006). Hydro-hegemony – A framework for analysis of trans-boundary water conflicts. *Water Policy*, 8(5). 435–460. <https://doi.org/10.2166/wp.2006.054>
- Zeitoun, M., Allan, J. A., & Alatout, S. (2016). The hydro-social contract and its discontents: A political ecology of Nile waters. *Water International*, 41(1), 105–120.