

Cooperative Governance of Transboundary Water in Greater Mekong Subregion: Challenges in the Lancang-Mekong Cooperation

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Abstract. Rivers not only provide the most basic water resources but also pertain to national strategic resources with crucial implications. When it comes to international relationships, transboundary water management is a major topic under discussion. Nowadays, numerous riparian countries worldwide are involved in the issue of transboundary water governance. Better cooperative governance of transboundary water among countries could facilitate economic progress and enhance sustainable development. This paper took Greater Mekong Subregion (GMS) as a case study, analyzed challenges in the Lancang-Mekong Cooperation, and put forward prospective solutions to address these problems in the hope of deepening the cooperation in managing the shared water resources within the river basin and further providing potential support for worldwide major river basin cooperative governance. By employing a combination of qualitative and quantitative methods, the paper found that current challenges for cooperation in the GMS are mainly: disputes over benefit distribution among countries upstream and downstream, different utilization of water resources and complex coordination, and multi-player games in the GMS.

Keywords: Transboundary River; Cooperation; Water resources governance; Greater Mekong Subregion (GMS).

1. Introduction

The issues of cooperative governance in major river basin areas worldwide are quite important and have gradually been recognized by various countries and organizations. The Nile in Africa, the Rhine River in Europe, the Amazon River in South America, etc.; these transboundary rivers flow across different countries and have brought about contestations over water utilization and related issues in history. Figuring out unique characteristics of transboundary waters management, including multilateral mechanism and institution set-up, is of significance for cooperative governance for transboundary water and related issues at a larger scale [1].

Transboundary water governance has been analyzed in diverse disciplines, including critical hydro politics, geography, international law, and environment [2]. A majority of research regard state as critical actors, and center on inter-state relationships when analyzing transboundary water governance, while a limited part of studies focuses on the interplay relationship between actors and mechanisms. In social theory, human beings are viewed as homo oeconomicus, pursuing individual interests while regulated by loose or restrictive rules and regulations in society [3]. In line with this approach, Wendt claimed that such interacting and interlinking relationships also apply to transboundary water governance, which perceives riparian states as individual players and cooperative mechanisms as a slew of regulations and rules [4]. Viewing member states as competing partners apart from united actors, states are attributed to properties associated with human beings, such as identities, rationality, interests, and beliefs [5]. Different from a deep analysis of specific actors, this paper took a comprehensive view and took into account multi-level stakeholders, covering internal and external countries to various mechanisms and institutions, and exploring complex interactions among them.

This paper takes Greater Mekong Subregion (GMS) as a case study, analyzing various actors and structures at the basin level, showing main challenges of cooperation among riparian countries, and illustrating potential ways to help address these challenges. Understanding how different factors influence riparian countries' considerations and behaviors would help to clarify the roots and manifestation of challenges for cooperation in the GMS, which offers a reference and inspiration for

transboundary water management in other basin regions worldwide, and contributes to building a more effective and inclusive trans-boundary water governance mechanism.

2. Background

The Lancang-Mekong River, originating from the Qinghai-Tibet Plateau, is the largest river in Southeast Asia. Lancang refers to the upper section of the river within China's territory, and the Mekong River denotes the rest part. The whole river runs across six countries in sequence: China (specifically Yunnan Province and the Guangxi Zhuang Autonomous Region), Myanmar, Laos, Thailand, Cambodia, and Vietnam. This trans-national region is named the Greater Mekong Subregion (GMS).

With abundant resources, the whole river has been regarded for a long time as the pillar of social-economic development and prosperity in GMS. The river provides suitable habitat for a large variety of fishes, essential water for irrigation, and convenient waterway transport for large quantities of goods. Renowned for the vibrant variety of life that ranks only second to that in the Amazon, the river owns an extensive freshwater fishing industry [6]. Besides, it supports tens of millions of people by offering various means of livelihood. Realizing the importance of water resources and economic benefits, countries occasionally get into friction and conflicts due to the transboundary water resources arrangement and relevant water use issues.

Table 1. Part of the cooperative mechanisms in the GMS

	Cooperation Mechanisms	Established Time	Initiators	Membership
Intra-Regional Mechanisms	Greater Mekong Subregion cooperation (GMS)	1992	the Asian Development Bank (ADB)	China, Thailand, Laos, Vietnam, Cambodia, Myanmar
	Mekong River Commission (MRC)	1995	/	Vietnam, Cambodia, Laos, Thailand, China and Myanmar (Dialogue Partners)
	ASEAN-Mekong Basin Development Cooperation (AMBDC)	1995	/	ASEAN, China
	Cambodia-Lao PDR-Viet Nam (CLV) Development Triangle	1999	/	Laos, Vietnam, Cambodia
	Ayeyarwady-Chao Phraya-Mekong Economic Cooperation Strategy (ACMECS)	2003	/	Cambodia, Myanmar, Vietnam, Laos, and Thailand
	CLMV Cooperation	2004	/	Laos, Vietnam, Cambodia, Myanmar
	Lancang-Mekong Cooperation (LMC)	2016	/	China, Thailand, Laos, Vietnam, Cambodia and Myanmar
Cooperation Mechanisms with External Partner Countries	Mekong-Ganga Cooperation (MGC)	2000	India	Thailand, Laos, Vietnam, Cambodia and Myanmar
	Mekong-Japan Cooperation	2007	Japan	Thailand, Laos, Vietnam, Cambodia and Myanmar
	Lower Mekong Initiative (LMI)	2009	The USA	Thailand, Laos, Vietnam, Cambodia and Myanmar
	Mekong-Republic of Korea Partnership	2011	Korea	Thailand, Laos, Vietnam, Cambodia and Myanmar

Rivers possess important metaphorical senses in geopolitics, in association with connectivity and symbolism [7]. Hydro politics analysis of the Lancang-Mekong basin has a long and rich tradition. After the cold war era, the Mekong region shifted from battlefield to marketplace, and riparian countries in the basin were conscious that they should work together congruously to tackle common problems [8]. Hirsch indicated how the meaning of the term ‘Mekong’ has changed over time: from a shared river, to a river basin including mainstream and tributaries, to a zone of economic linkages across countries, to an arena of contention over development strategies such as dam construction [7]. Over the past 20 years, riparian countries have established multifarious multilateral mechanisms (Table 1) to intensify cooperation. According to Le, about 15 cooperative mechanisms exist in the GMS now, which can be divided into two sets: cooperation among GMS countries (intra-regional mechanisms) and cooperation between the GMS countries and countries outside Southeast Asia [9, 10]. The alphabet soup of cooperation initiatives demonstrates that the GMS is of significant geostrategic and economic interest to many countries inside and outside Asia.

3. Challenges for Lancang-Mekong River Cooperation

3.1 Disputes over Benefit Distribution between Upstream and Downstream Countries

Dam development always remains contested among diverse key stakeholders in river basins worldwide. It has been estimated that the GMS has over 200,000 MW of potential hydropower resources [11]. Population increases and rapid industry expansion within the region cause rapid growing demand for energy, and governments have sought hydropower and reservoir construction projects to relieve energy pressure [12].

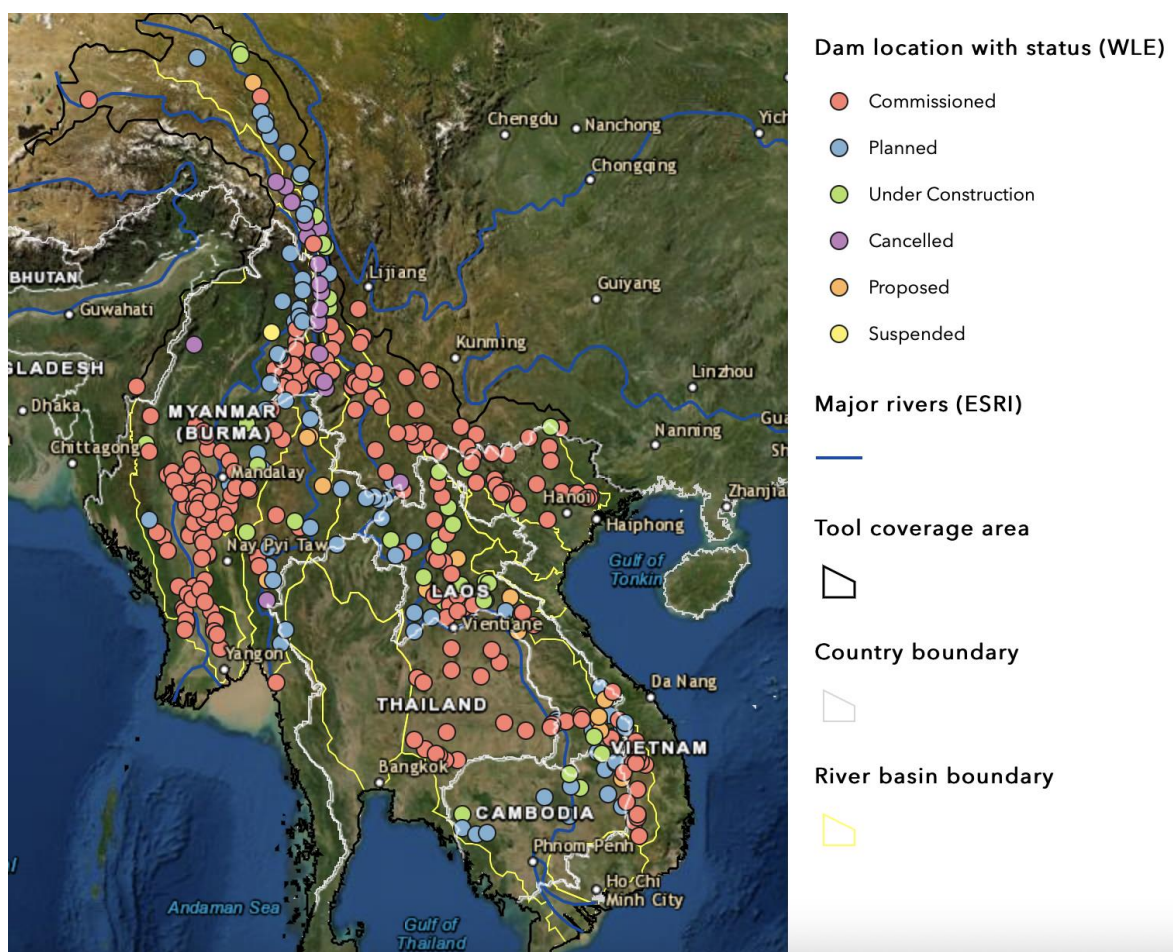


Figure 1. Dam construction in the GMS [16]

As of 2019, the hydropower projects in the GMS have 43890 MW total installed capacity; approximately 68% is generated on the upper Lancang river, 11% through the lower Mekong mainstream, and the rest by the lower tributaries [13, 14]. A review of hydropower in the GMS compiled an inventory of 32 projects in operation, 24 under construction, and a further 68 proposed projects [15]. Fig. 1 marks the main dam construction developments in the region.

Hydropower is considered a relatively cheap renewable energy, contributing less greenhouse gas emissions. However, the advantages of hydroelectric energy cannot justify numerous hydropower projects since the disadvantages of hydropower are hardly to be dismissed. The construction of a hydroelectric station is a major source of friction in the GMS because of its transboundary effect. Normally the tradeoff of hydropower construction can be made within one country, but the case in the GMS countries is much more complicated, as upstream countries usually enjoy benefits of hydropower while the downstream countries have to pay its costs.

The three major water-dependent sectors in the GMS are agriculture, fisheries and hydropower [11]. But hydropower stations upstream would significantly impact the production of both agriculture and fisheries downstream. It would reduce the runoff water downstream, decrease sediment transport and increase salinity levels of the river. Also, dam-building would, to some degree, disrupt the ecosystem and biodiversity around the waters, blocking fish migration routes and reducing nutrient flows downstream [6, 17]. Hui Fan indicated that dam impoundment would alter water quality by slowing down the flow rate of the river and weakening the self-purification ability [18]. Whereas upstream countries take advantage of the river, those downstream are unwilling to pay the cost but enjoy little benefits. Generally, the downstream countries may feel threatened by the ones upstream, which may aggravate distrust and cause more regional tensions.

3.2 Different Utilization of Water Resources and Difficult Coordination

China is endowed with affluent water resources due to geographical advantages. On the contrary, it's shown in Table 2 that downstream countries relied heavily on external water to meet their water demand. Apart from different dependency ratios, each country's requirements and goals in this basin vary depending on many other factors, including development status, competitive industries, and economic structure [20]. Table 3 demonstrates the different focus of water use in the GMS. Myanmar and China lay emphasis on hydropower development to generate more electricity. Thailand intends to secure water resources for irrigation in the northeastern region from excessive water extraction. Cambodia focuses on fisheries productivity and crop yields in floodplains. With a majority of Laos' land in the river basin, hydropower construction projects have gained much attention in Laos [21]. Meanwhile, Vietnam attaches importance to the river's flow velocity to hold back saline intrusion and ensure agricultural irrigation.

Table 2. Water resources of six countries in 2019 [19]

Country	Total External Renewable (10 ⁹ m ³ /year)	Total Renewable (10 ⁹ m ³ /year)	Dependency Ratio (Total External Renewable / Total Renewable)
Cambodia	355.50	476.10	74.67
China	27.32	2840.22	0.96
Laos	143.10	33.50	42.91
Myanmar	165.00	1167.80	14.13
Thailand	214.10	438.61	48.81
Vietnam	524.70	884.12	59.35

Table 3. The different focus of water uses in the GMS

Country	Focus Fields
China	hydropower
Myanmar	hydropower
Thailand	irrigation
Laos	hydropower
Cambodia	fishery, irrigation
Vietnam	irrigation

A long list of established cooperation mechanisms in the GMS plays roles in helping negotiate all these demands, different or conflicting to some extent. Nevertheless, most organizations and mechanisms, by nature, are classified into loose consultative frameworks [22]; they do not exert influence by way of a connected network of regulations but facilitate information exchange for each of the states through formal or informal meetings or sessions. Although riparian countries acknowledge the joint principles, when principles clash with interests, the former has often been sacrificed [23]. Take the example of the Xayaburi hydropower dam [24]. The construction project received bitter opposition from many countries due to poor environmental assessments, but it was eventually implemented. In the process, Thailand initially objected to the project but later shifted to support due to the dam's most significant investment coming from a Thai company [25].

It can be noted that the lack of a centralized international body in the region with real power will always cause trouble as to how countries and institutions can coordinate with others to avert project fragmentation as well as to reach consensus and compliance between various projects and missions. The disregard for common principles when pursuing national interests also stems from the absence of a robust regulatory body. Admittedly, different countries in this region have different interest demands and sometimes have to join the competition to strive for maximum national interest in water utilization. Without effective solutions, such suspicions and competition among cooperative mechanisms would fatally undermine the effectiveness of collaboration and communication in the GMS.

3.3 Multi-Players Games in the GMS

As mentioned before, there exist many cooperation mechanisms in the GMS. Some have few practical effects and gained slow progress [26]; Some Mekong initiatives focus on several sectors and work on balancing each other. However, they form a complicated network liable for overlapping functions and ineffective resource use [10]. For example, GMS cooperation, initiated by the ADB, covers ten priority areas for collaboration, such as transportation, energy, trade, and environment, which to a large extent, is similar to the coverage area of the MLC. Overlapping is somewhat unavoidable, as potential areas worthy of investment are limited. Thus, it's challenging to coordinate existing cooperation mechanisms and address duplication to create a coherent cooperative system to ensure joint effort.

Another factor that hinders joint effort lies in the participation of outside stakeholders. Many present cooperative mechanisms are initiated by external countries [27]. Similar to the different focuses and interests of countries within the region, the participation of outside stakeholders with different aims would further complicate the challenges of cooperation. In addition to the already existing problems such as conflicts of demands and trust crises, the political relationship between major leading countries within or outside the region is a big concern for regional development. Under strained relations in China-American relations, for instance, deeper inter-institutional cooperation is hardly achieved. Concurrently, growing friction between China and Japan concerning infrastructure construction is more apparent, as Beijing focuses on the North-South corridor development while Tokyo dominates on East-West and Southern linkages [28].

Despite the conflicts among leading countries within or beyond the GMS, the disparity in economic status between riparian countries is another obstacle. The latest cooperative initiative in the

GMS was the Lancang-Mekong Cooperation mechanism (LMC) in 2016. Unlike previous cooperation mechanisms that involved countries outside the GMS, such as Japan, Korea, the US, and India, the LMC only comprises six riparian states in the region. Notably, China promises to provide extensive financial funding and development assistance to the rest countries. The power gap between China and other riparian countries is relatively huge; thus, people fear that cooperation through the LMC mechanism could be pretty lopsided. In contrast to China's second-largest economy globally, Cambodia, Laos, and Myanmar are categorized as the least developed countries. Six countries in the GMS are supposed to own equal rights concerning water use and obligations to protect water resources. But in practice, due to distinct economic leverage and geographic position, total equity in river management is hardly guaranteed. In addition, there is suspicion among countries that China may wield "hydro hegemony" to increase impact and expand its power regionally [29].

4. Solution

4.1 Establishing Sophisticated Mechanisms of Benefit-sharing

The disputes over water allocation can be attributed to the lack of an interest-sharing mechanism. The benefit-sharing mechanism means securing benefits from and beyond the physical water and enabling riparian countries to accordingly share varying benefits. It has different manifestations given different conditions of river basins. For example, along the Nile River, upstream counties should take advantage of upstream rainfall, and make rain-fed farming with more efficiency; thus, downstream countries may face less pressure on demand for the Nile's flow volume [5]. In the GMS, inclusive and flexible electricity trade could be an approach for a benefit-sharing mechanism. Electricity produced upstream could be sold to downstream countries at preferential pricing, which serves as an implicit benefit and somewhat offsets the cost of dam construction taken by downstream countries. Ensuring interest-sharing mechanisms that benefit all stakeholders is conducive to minimizing contradictions and efficiently reaching agreements. Xayaburi hydropower station construction plan in 2009 was initially faced with resistance vehemently due to adverse environmental assessments. However, later a short period, construction still got started as Laos and Thailand reached an agreement in electricity trade for mutual benefits [6, 30]. Nowadays, other than massive purchases by Thailand from Laos, electricity trade between most countries in the GMS only takes up a small part [31]. Riparian countries could expand cross-border electricity trade to better employ the synergy effect in the future.

Aside from national political interests, benefit-sharing mechanisms should be dynamic and comprehensive, taking people's well-being and social development as a whole. For instance, if a certain GMS country is under attack by natural disasters, the rest have the responsibility and obligation to offer relief material and other compensation.

4.2 Building a More Transparent and Polycentric Coordination System

As analyzed before, the lack of a central and powerful regulator body is mainly responsible for the complex coordination of different countries' demands. As a result of the insufficiency of institutional capacity, riparian countries could abandon principles in pursuit of their own interests [6]. However, it's hardly possible to establish such strong authority in Southeast Asia, as Asian countries are deficient in some conditions to form a similar coalition to European Union. What's more, it should be recognized that different stakeholders in the GMS indeed play important roles. Most Mekong countries are socially and economically underdeveloped; foreign aid would promote the nation's progress on a large scale. As for outside countries, they expect to augment better relations with riparian countries and increase their influence in the region by advocating their framework of water governance [17]. Also, to balance China's water power and avoid political asymmetry, it's sensible for downstream countries to welcome assistance from outside governments and non-governmental organizations (NGOs). Even though political games among multi-level actors are sometimes

inevitable, the ultimate goal for the GMS is to improve people's living conditions and economic development.

Therefore, the alternative solution may lie in developing a more polycentric and transparent coordination system. Two essential elements must be taken into account. First, diverse and multi-level participants are favorable and encouraged. By forming a polycentric coordination mechanism, these participants could prevent political asymmetry through check and balance; non-state organizations or private partners are also capable of initiating different forms of collective action. The wide range of cooperative partners could ensure the diversity of funds and external donors [10]. Thus, the GMS would also receive diverse financial investments for sustainable development. Second, the processes of decision-making are supposed to be transparent. Riparian countries should share water flow data and keep constant information exchange to build mutual trust and deepen connectivity. Besides, they may set up research centers and strengthen academic communication to jointly address water insecurity in the region [6].

Even though there exist political games between major countries, the primary purpose of all these mechanisms and organizations is to promote economic development and poverty reduction. A genuinely transparent and balanced coordinating system engaging all participants equitably would benefit all parties.

5. Conclusion

Cooperative governance of transboundary water is increasingly vital concerning international relationships and public policy administration. This paper used the case study of the GMS, and analyzed three challenges for the Lancang-Mekong Cooperation: disputes over benefit distribution among countries upstream and downstream, different utilization of water resources and complex coordination, and multi-player game in the GMS. Furthermore, two prospective solutions were developed to help tackle these challenges: establishing sophisticated mechanisms of benefit-sharing, and forging more transparent as well as multi-level systems for coordination.

In reality, almost all disputes among actors can be attributed to disagreement about interest allocation; and factors such as the status of social development, geographical proximity, and correlation dependence complicate this process of distribution. Consequently, regulations and rules in place are needed to coordinate and supervise different actors.

Looking ahead, the inclusive transboundary water governance mechanism should get more emphasis around the world. Riparian countries share the same rivers, which are not only a geographical watershed but crucial to politics, economics, and people's livelihood for any nation. With a better cooperative management mechanism for water resources, all countries should benefit from mutual trust and efficient information exchange.

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