

Appendix 1. Full characterization of the lower Mekong basin case study based on social-ecological system meta-analysis database variables.

Variable	Characterization
Actor group: the MRC and the LMB riparian nations	
Actor Scientific Knowledge	The MRC possesses a significant amount of information and technical knowledge on the MRB, particularly on hydrology and water quality. However, the MRC still lacks statistics on fisheries, and has problems predicting the water flow, floods and droughts.
Monitoring Technology	Latest technologies and technical support from developed countries such as Canada and the USA.
Self/external monitoring	Procedures for Data Information and Exchange Sharing, Water Use Monitoring and Notification, and Prior Consultation and Agreement.
Environmental monitoring	Present in the LMB since 1986, including water quality, hydrological and meteorological monitoring stations. Some difficulties in monitoring water flow due to lack of access to the Chinese part of the river. Also, reduced accountability of monitors (national governments).
Economic Heterogeneity	High, Thailand being the most developed state in the group, Vietnam rapidly developing, and Cambodia and Laos lacking basic human development.
Economic Dependence	The LMB riparians are highly dependent on the river for hydropower as well as irrigation and navigation and fisheries.
Economic Status	Medium, all members of the MRC are developing countries. Thailand, the most developed one of the group, has been suffering from an economic downturn in the last decade.
Commons Political Power	The MRC's power is limited due to its full dependency on donor funding and lack of mandate to act on its own without prior approval from its member countries.
Actor group Boundary Clarity	The MRC's scope includes only the lower Mekong river, excluding the tributaries and the half of the river flowing through China.
Actor group Boundary Fuzziness	China's Dialogue Partner status keeps open a unilateral stance on river basin development
Costs Benefits	With no benefit-sharing provisions in place, the MRC is mostly financed through international donors, incurring few costs for its member states. Benefits include projects in water monitoring and creation of work places.
Interest Heterogeneity	Conflicting interests of the riparians: hydropower development, a common interest of all member states, poses a threat to Cambodia, Laos, and Vietnam, who are also dependent on the river's fisheries and irrigation capacities.
Past Collaboration	Institutionalized cooperation in the LMB since the 1950s did not stop even in times of hostility. Long-standing economic cooperation within the framework of the ASEAN and the ADB
Environmental common: Water flow (as used for hydropower and fisheries)	

Beginning Condition	LMB hosts some of the most productive fresh water fisheries in the world (with reports of declining catches in the past several years, possibly due to falling per capita rather than total catches); annual river discharge 460 billion m ³ .
Bio Diversity Trend	Dams are predicted to have detrimental effects on fish biodiversity, 16% of species threatened with extinction.
Commons boundaries	Good knowledge of the limits of the Upper and Lower basins, mainstream river and tributaries; and of the location of dams and fish hotspots.
Commons Condition Trend	Declining, with upstream dams negatively affecting water flow for irrigation, sediment content, and fish populations.
Dams	31 dams on the tributaries and the Upper and Lower mainstream Mekong. 12 new dams planned in the mainstream.
Dams Role	Production of hydropower, water storage, reservoir fisheries. Expected negative effects on water flow predictability, sediment flows, and capture fisheries.
ES Markets	Both for fish (estimated at US\$3.9–7.0 billion per year) and for hydropower, with Thailand and Vietnam investing in Laos.
Human Population	High rate of population growth.
Run off Input	Salt water intrusion in the delta during dry season.
Technical Storage	Water storage in dams; fish storage in ponds and dams.
Technical Substitute	None, neither for fish nor hydropower generation. Little room to mitigate impact of dams on fisheries.
Physical Boundaries	Good knowledge of the limits of the Upper and Lower basins, mainstream river and tributaries; and of the location of dams and fish hotspots.
Intra and Inter Annual Predictability	Water flow: moderate due to climatic factors, decreasing because of Chinese mainstream dams. Fish: moderate due to water flow variations and mobility.
Commons Mobility	87% of species in the LMB are migratory, many with mobility range over 100 km.
Productivity	High water flow productivity due to heavy precipitation and large catchment area (highest potential for hydropower generation in Laos); the most productive freshwater fishery in the world.
Renewability	Fish is renewable; not applicable to water flow.
Spatial Heterogeneity	Moderate, water flow naturally heterogeneous with highest hydropower potential in Laos, and the highest fisheries potential in Cambodia, particularly in the lake Tonlé Sap.

Governance System: the (Lower) Mekong agreements and programs

Conflict Resolution	Lack of institutionalized conflict resolution mechanisms, the MRC process has still contributed to informal conflict-solving.
Self/External Sanctions	The MRC lacks binding rules and sanctions for rule violators.
Proportionality	The contributions of riparian countries to the governance system's infrastructure have been rather limited. The opportunity costs of stopping current dam building plans are high; the benefits in terms of fisheries conservation are unclear.
Socio-ecological fit	Studies recognize spatial and temporal variability of the ecosystem services provided by the basin; programmatic

activities of the MRC are also tailored target different areas within the basin; however, the MRC regulations apply at the basin scale.

Participation in Rule making	The LMB governance system provides structures for collective choice among the riparian countries.
Trust	Unique “Mekong spirit”, formed through decades of cooperation on water-related issues.
Metric Diversity	Goal of the treaty: to maintain a healthy and sustainable ecosystem while promoting economic growth and development has not changed since its inception.
Trigger	Peace treaty with Cambodia (turned the cooperation in the region towards searching for a balance between economic and social development).
External Recognition	The MRC is funded mostly by third parties, including the World Bank; UNDP played a key role in promoting negotiations which led to the MRC establishment.
Multiple Levels	Three branches of the MRC (the Council, Joint Committee (JC), and the MRC Secretariat), complemented by the National Mekong Committees in member nations.
Horizontal coordination	Coordination between MRC programs, and between the LMB governance system and the ADB or the ASEAN is still nascent.
Science Based Policy	The MRC tries to make decisions based on scientific assessments, but faces problems with its implementation on behalf of the member states (Xayaburi dam case); mostly absent in member states (economic considerations prevail).
