Enclosing the Commons?: Hydropower Dams in the Lancang-Mekong River

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Abstract

Since the 1990s hydropower dams are increasingly being constructed on the mainstream of the Lancang-Mekong River to reduce the dependency on fossil fuels. Hydropower dams are large infrastructures that bring forth implications to the environment, thereby contesting the Lancang-Mekong River as a transboundary commons. Transboundary commons such as the Lancang-Mekong River are not easily enclosed. Yet governance structures and spatial arrangements serving the interests of hydropower development may lead to the exclusion of riparian communities living along the river basin. By means of a thematic topographical map and document analysis, this paper argues how the building of hydropower dams in the mainstream Lancang-Mekong reconstructs the transboundary commons into a hydropower generating system in which the river functions primarily as a system rather than a watercourse that gives and sustains life.

Keywords: document analysis, hydropower dams, Lancang-Mekong River, topographic maps, transboundary commons

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The Lancang-Mekong's Commons and Commodity

With a mainstream of approximately 4350 km long, the Lancang-Mekong River is a transboundary commons that expands itself over six nation-states (Middleton, 2022). The Lancang-Mekong River originates from the plateau of China's Tibet Autonomous Region where the river is referred to as Lancang (Soukhapon et al., 2021). Subsequently known as the Mekong, the river then flows into Myanmar, Laos, Thailand, Cambodia, and ultimately Vietnam where it mouths into the South China Sea (Soukhapon et al., 2021). The river basin is home to over 70 million inhabitants whose livelihoods and cultural belongings are traced back to the commons (Kuenzer, 2014). Interventions in the river hence affect millions of people challenging the commonality of the river (Middleton, 2022). The most prominent interventions undertaken in the river are hydropower generating dams (Soukhapon et al., 2021). Since the 1990s the Lancang-Mekong River's mainstream has been subject to dam-building constructions harnessing the power that can be generated by the river (Middleton, 2022). To date, hydropower dam constructions are increasingly being embarked on in the river to reduce the dependency on fossil fuels (Hecht et al., 2019). Hydropower dams are large infrastructures and their materialization as human artifacts disrupts the entire environment, threatening to enclose the commons and thereby affecting the necessities of life for millions of people (Middleton, 2022).

With continuous development and increased reliance on hydropower dams as an alternative to fossil fuels, research cannot be static. Anthropocentric approaches are often applied in literature regarding transboundary rivers undermining the inherently intertwined ontology of the very nature of rivers as a commons which is a challenge beyond domestic and international discourse (Yong, 2020). river as a commons. This paper does not seek to argue the anthropocentric or terrestrial bias of the Lancang-Mekong River, rather it aims to

understand the reconstruction of the Lancang-Mekong River as a transboundary commons by assessing the spatial propositions relative to the hydropower dams. This enables the formulation of this paper's query, '*How does the building of hydropower dams in the mainstream of the Lancang-Mekong reconstruct the river as a transboundary commons?*'. The study pursues to do so by conducting a paradigmatic case study and making use of existing qualitative data analysis, consisting of topographical thematic map analysis and document analysis. Conventional studies regarding the Lancang-Mekong River dismiss the importance of maps as analytical tools that are significant in shaping and constructing territorial understandings of the commons (Wanberg, 2020). Hence, this study seeks to utilize this tool making use of its value-loaden visualization as a means to assess how transboundary commons are depicted and thereby potentially reconstructed. This fosters a greater in-depth understanding relative to the intersection of large infrastructures such as hydropower-generating dams over the Lancang-Mekong as a transboundary commons.

The following section of this inquiry, the theoretical framework, shall elaborate upon the various concepts surrounding transboundary commons and the interaction with water, hydropower, and ultimately the inherently intertwined interaction maps. This is followed by the methods containing this paper's research design and data collection. Succeeding the methods are the results of this paper's topographical map and document analysis. Finally, this paper concludes with a summation of the analysis and findings followed by recommendations for future inquiry.

Theoretical Framework

Transboundary watercourses such as the Lancang-Mekong River are subject to various complexities relative to its understanding and governance as a commons. To contextualize the commonality of the watercourse this framework enters through the regional setting of the Lancang-Mekong River. This is followed by an understanding of transboundary commons in regard to water, its governance, and the importance of topographical mappings of the spatial arrangements. Finally, the materialization of hydropower dams itself, and the role power and commodification play are elaborated upon.

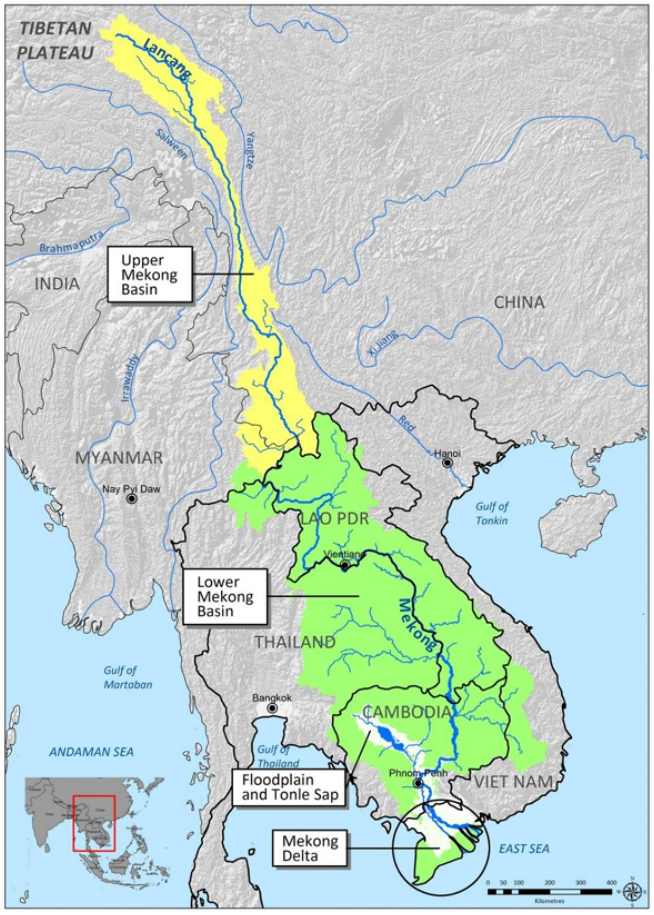
The Lancang-Mekong Basin

The Lancang-Mekong River expands itself over six constructed state borders as the river stems from China's Tibet Autonomous Region, before moving into Myanmar, Laos, Thailand, Cambodia, and Vietnam, see Figure 1 (Soukhapon et al., 2021). The source of Lancang-Mekong River's headwaters form in the Tibetan Plateau at an altitude of 4970 meters before flowing into the steep regions of the Chinese provinces Qinghai and Yunnan, and marking the borders between Laos and Myanmar (Le Meur et al., 2022). Heading downstream the Lancang-Mekong outlines the borders between Laos and Thailand, from here onward the region is characterized to be less elevated with its slope moderating (Kuenzer, 2014; Le Meur et al., 2022). In Laos' Champasak province, the river gets characterized by plains, broad areas of flat land, and starting from Thailand's Chiang Saen the Lancang-Mekong Basin can be divided by its geographical boundary, from where the basin can be referred to as the lower basin (Le Meur et al., 2022). The river then flows into the

plains of Cambodia and Vietnam where the Mekong Delta mouths into the South China Sea (Le Meur et al. 2022; Soukhapon et al., 2021).

Figure 1

The Lancang-Mekong River Basin



Note. The Lancang-Mekong main river and its tributaries (MRC, 2019).

The Lancang-Mekong River is crucial to the livelihoods of millions of inhabitants across all of the riparian countries. Anthropogenic stressors varying from the construction of hydropower dams to human-induced climate change alter the river's natural flow affecting the human activities embarked upon the river (Pearse-Smith, 2012). For many the Lancang-Mekong River is defined by its commonality, a shared resource, however, the transboundary nature of the Lancang-Mekong River challenges the modes in which its water and resources are "held and managed in common." (Hirsch, 2006, p. 107). As such

hydropower dams affect not only the Mekong as a transboundary commons but over time and space the very nature of water, its biodiversity, anthropogenic activities, and the geopolitical surroundings as a whole (Sneddon & Fox, 2006).

Speaking of the Commons

Water in its embodiment as a river has supplied people throughout human history as people have disproportionately found themselves located along rivers with water usage varying from agricultural activities to means of transportation (Wohl, 2020; Yong, 2020). What differentiates the use of water by people from other beings of life is the extent and intensity to which humans alter the biography of the watercourses (Wohl, 2020). As such, water becomes a ubiquitous matter actively regulating and shaping people's lives, societal processes, cultures, and political economies (Wheeler & Hussein, 2021; Mollinga, 2008). The nature of water itself is an inherently political entity as the matter and its use is disputed beyond its social life, instituting governance (Wheeler & Hussein, 2021; Ballestero, 2019). This proves to be especially prominent regarding transboundary commons such as the Lancang-Mekong River which reveals the embedded complexities surrounding water governance (Mirumachi, 2015; Kuenzer, 2014). The Lancang-Mekong River basin is home to over 70 million inhabitants spatially dispersed throughout different governed institutions namely, borders (Miller, 2020). These borders are also perceived in the Lancang-Mekong River basin in Figure 1, where the river acts as a constructed state border, in particular between Laos and Myanmar and Laos and Cambodia (Le Meur et al., 2022). Looking beyond rivers as the mere demarcation of spaces it is perceived that rivers as landscape attributes have been serving as actors shaping politics themselves (Kuenzer, 2014; Thomas, 2021).

The politics of transboundary commons in particular are increasingly being territorialized given the socio-spatial contexts in which the river is defined (Yong, 2020).

Understanding the commonality of the watercourse involves understanding the fluid and dynamic three-dimensional geographies that encompass the territoriality of the river (Yong, 2020). Geographically rivers defy produced spatial governing arrangements as they themselves shape the geographies of governance (Miller, 2020). Just as many other common resources, rivers hold the ability to transform and shift into various forms, however, human-interests-driven governance often perceives rivers as passive entities with governance unfolding around them (Miller, 2020). Just like water, the transboundary commons of the Lancang-Mekong defy fixity, and the transnational interaction surrounding the commons and its organized governance allows for the production of scalar constructions and power dynamics (Yong, 2020). The river's governance often takes place transnationally and distanced from the local riparian communities, the rights to confer underlying notions of access, exclusion, power, and control are thereby enabled by the governing structures (Hirsch, 2006; Yong, 2020). The commonality of the river to riparian communities and thereby the use and access of water allow anthropogenic activities and cultural belongings to be traced back to the watercourse (Kuenzer, 2014). Transnationally, for riparian countries and corporations, this means having the capacity to trade, agribusinesses, and contemporarily the ability to produce hydropower energy (Kuenzer, 2014). The anthropogenic modification of river landscapes by hydropower dams raises questions of power and control as the capitalist projects do not conform to the time and spatial dimensions of the environment (Grundry-Warr & Lin, 2020).

These river landscapes and spatial dimensions of environments can be visualized in topographical maps as the use of maps is exemplary for shaping the conditions of how people perceive space, political authority, and territories (Forbes, 2015). Topographical maps in particular are significant in assessing landscape attributes such as rivers and their morphological transformations (Forbes, 2015). However, maps are not free of value as they

visualize the world in particular social relations, and those who make it constitute a particular knowledge (Harley, 2009; Hohenthal et al., 2017). The status and authority of the producers of cartographic maps such as topographic maps become apparent when displaying the spatial distribution of resources as depictions often serve the interests of power, states, or corporations (Hohenthal et al., 2017). In terms of the physical dimensions of rivers in particular water as a commons, mapping reveals the division of territories emphasizing social vulnerabilities (Stokman & Pelger, 2020). Maps do not accommodate to the scale of everyday human life as small details or nonphysical boundaries, allowing these to be dismissed by those in power (Hohenthal et al., 2017). As such maps can be defined as propositions rather than factual representations, and topographical maps in particular can therefore be understood as semiotics and systems of value (Hohenthal et al., 2017).

Beyond the Economic Bottom Line: Hydro-Power

Nature and its material landscape attributes such as rivers can be perceived as being separate from its environmental context, rather than an intricate part of it, thereby forming its own ontological understanding as a distanced pure or fixed entity (Choi, 2016). In contrast to this nature can also be perceived as being "[...] metabolically related through material exchange" relative to its environment (Choi, 2016, p. 616). These means by which nature is socially produced allow for its de- or commodification (Green & Baird, 2016). For instance, in a capitalist economic system nature's material manifestation, or raw resources, can be transformed into productivity assets, nature then becomes abstracted from its sociocultural context and reduced to mere material elements allowing it to be used as a resource and commodity managed through market mechanisms (Benediktsson, 2007; Green & Baird, 2016; Hirsch, 2006). This binary understanding of nature undermines the complexity of the

sociality of nature itself and mediates spatial practices of environmental commons (Benediktsson, 2007; Grundy-Warr & Lin, 2020). Similarly goes for water, as it can be argued that water flows are transformed into a system in which water becomes an enclosed common used for the production of electricity (Jakobsson, 2002).

Perceiving environments as distinct enables nation-states to assume mastery over the transboundary commons and thereby water itself (Allouche, 2020). According to Zeitoun and Warner (2006), mastery over the resource of water is often sought to be obtained in the asymmetric power relations between riparian states. Water commons resources control strategies such as capture, integration, and containment can then be realized (Zeitoun & Warner, 2006, p. 444). Maerthens and Pfliger (2018) exemplify how in particular the quantity of water is related to the exploitation of the resource. In general, the materiality of fresh water is characterized by its "quantity, repartition, quality and main uses." (Maertens & Pfliger, 2018, p. 368). Hydropower is generated by this quantity and the drop of water, those in power of the hydropower dams further decide based on demand the quantity and time of the water flow through the turbines or sluice gates (Jakobsson, 2002, p. 44). Although this manner of generating electricity is often thought to be sustainable, next to its environmental implications, the generated hydroelectricity cannot be stored for future use and therefore needs continuous regeneration and renewal (Menga, 2016). Consequently, hydropower dams are also not singular entities as they require the realization of various types of infrastructures to operate (Rogers et al., 2023). As such large infrastructures, hydropower infrastructures are often understood as "[...] extension of state control over sometimes unruly, remote or marginal landscapes and their residents." (Rogers et al., 2023).

Hydropower dams are material interventions in the watercourse that alter the river's very biography, transforming the waterway into a commodity contesting the resource as a common resource (Middleton, 2022; Grundy-Warr & Lin, 2020). This is due to the

materialization of hydropower dams rearranging spatial arrangements through which transboundary commons are governed allowing the regulation of access, and exclusion (Grundy-Warr & Lin, 2020; Miller, 2020). Hydropower dams affect more than the watercourse itself, the dams bring forth implications to the Lancang-Mekong environment far exceeding spatial boundaries with cascading effects in the long term (Middleton, 2022; Mahanty et al. 2023). Such effects include the disruption of biophysical processes and the redistribution and dispossession of access to the commons, by for instance the forceful relocation of riparian communities (Middleton, 2022, p. 254). The river then becomes a distribution line, often mirroring power distributions in society (Jakobsson, 2002). Dams are consequently instances of large infrastructures that enable the capturing of the resource of water as well as forming an advantage to the proprietor concerning competition over water (Zeitoun & Warner, 2006). This is also perceived in the Lancang-Mekong River where recent hydropower dam developments have transformed the river from a mainly non-regulated river into an increasingly enclosed common for hydroelectricity by public and private developers (Hecht et al., 2019).

Before the 1990s hydropower development in the Lancang-Mekong basin was limited and mainly publicly funded whereas the contemporary wave of hydropower projects is prominently being undertaken by partnerships between commercial entities, private actors, and host governments (Pearse-Smith, 2012). In the Lancang-Mekong River basin, this means that next to nation-state governments, actors varying from international to regional actors such as intergovernmental organizations, private corporations, or local communities, also contribute to the shaping transboundary water interactions (Rogers et al., 2023). With transboundary rivers being intertwined beyond constructed understandings of nation-states and spatial power arrangements greater interactions on a political geographic scale is revealed (Hirsch, 2016; Sneddon & Fox, 2006). Enhanced usage of water as a resource for human

activities, such as hydropower dams, transforms the material and spatial distribution of water (Middleton, 2022). The moment a river becomes abstracted and its water commodified the commonality of the river becomes contested as access to the water resources is challenged (Grundy-Warr et al., 2020).

Methods

To comprehend how hydropower dam buildings reconstruct transboundary rivers as commons this paper seeks to conduct a paradigmatic case study of the Lancang-Mekong River focusing on the construction of hydropower dams on the mainstream. The following sections shall elaborate on this inquiry's design, data collection, and finally, the reliability, validity, and limitations of this study are discussed.

Research Design

This inquiry pursues qualitative research, in particular a case study, as this allows for in-depth analyses contributing to identifying and critically analyzing the ways in which hydropower dams reconstruct understandings the Lancang-Mekong as a transboundary commons (Creswell & Creswell, 2017). Many studies focus on the elements that characterize the materiality or physical body of water whereas this study seeks to further scrutinize this by looking at the very intersection of a human artifact and its governance, relative to the Lancang-Mekong as a transboundary commons (Middleton, 2022; Sneddon & Fox, 2006). The research question, "*How does the building of hydropower dams in the mainstream of the Lancang-Mekong reconstruct the river as a transboundary commons?*' can be operationalized accordingly. For the hydropower dams, this research shall exclusively focus on dams that are (to be) constructed on the mainstream of the Lancang-Mekong River for the means of generating hydropower. The Lancang-Mekong River as a transboundary commons will be defined by its commonality, a shared unrestricted resource that is an intricate part of the environment and thereby its riparian states and communities. The transboundary commons can thus be assessed by the notions that surround its governance and thereby the commonality as understood by Hirsch (2006) and Yong (2020), namely, power, control, access, and exclusion.

To answer the research question this study seeks to draw together the complexities regarding the hydropower dams built in the mainstream of the Lancang-Mekong as a commons and analyze these through a topographical thematic map, and document analysis. The use of maps is in particular significant as maps produced and incorporated by the various parties concerned tend to reveal their visual symbolizations of the mapped environment (Kimerling et al., 2016). The thematic topographical maps allow its producers to reveal divisions of territories whilst displaying water as a common resource's physical dimensions (Stokman & Pelger, 2020). Maps are ultimately powerful political tools that shape territorial understandings thereby allowing their propositions and values to be analyzed (Harley, 2009: Wanberg, 2020). The maps will be derived from the document analysis, which shall cover a broad range of documents varying from annual basin reports, to strategic environmental assessment reports, published by various actors involved in the hydropower development of the Lancang-Mekong River. The map analysis reveals how maps proposition the commons and the document analysis sheds light on constructed nature of the commons and thereby the underlying environmental understandings providing a more detailed social and political context to the transboundary commons. Employing both document and thematic map analysis allows for the triangulation of data methods enabling rigorous and high-yielding comprehension of the variety of understandings of the hydropower dams in the Lancang-Mekong River (Morgan, 2022).

Data Collection

Data regarding hydropower and the case study of the Lancang-Mekong River is derived from databases and online web pages that are publicly available. The document analysis data consists of a total of fifteen documents, of which seven are Annual Reports from the Mekong River Commission (MRC); one Strategic Environmental Assessment from the International

Centre for Environmental Management; one Environmental Impact Assessment from Earthrights International; one Energy Sector Assessment Strategy from the Asian Development Bank; one Greenbond Framework from the Xayaburi Power Company Limited; two environmental assessments of the Lancang dams and; one research published by the Mekong Environment Forum, see Table 1.

Table 1

Documents analyzed

Year	Title	Organization	In-text reference	Pages
2010	Strategic Environmental Assessment of Hydropower on the Mekong Mainstream - Summary of Final Report	International Centre for Environmental Management	SEA	23
2010	Annual Report	MRC	AR 2010	76
2012	Annual Report	MRC	AR 2012	31
2014	Annual Report	MRC	AR 2014	56
2014	Environmental and Social Impacts of Lancang Dams	International Rivers	IR 2014	12
2016	Annual Report	MRC	AR 2016	64
2016	Environmental Impact Assessment in the Mekong Region	Earthrights International	EIA 2016	155
2017	Annual Report	MRC	AR 2017	100
2018	Annual Report	MRC	AR 2018	89
2019	Annual Report	MRC	AR 2019	115
2019	Lao People's Democratic Republic Energy Sector Assessment, Strategy, and Road Map	Asian Development Bank	ESAS 2019	91
2019	Environmental Changes Monitoring and Assessment in Lancang River Basin Under Impact of Hydropower Development	National Institute for Environmental Studies	NIES 2019	23
2019	Sustainability Report	China Huaneng	CHG 2019	46

		Group		
2020	Ecocide on the Mekong: Downstream Impacts of Chinese Dams and the Growing Response from Citizen Science in the Lower Mekong Delta	Mekong Environmental Forum	MEF 2020	19
2021	Green Bond Framework Xayaburi Power Company Limited ("XPCL")	XPCL	XPCL 2021	20
				920

For this study, a time period starting 2010 to the present was taken into account given that hydropower development has increasingly gained attention in the past decade as understood by Middleton (2022) and Soukhaphon et al. (2021). The reports' publishment dates shall accordingly be within this time frame. The documents accumulate to a total of 920 pages that have been analyzed through the use of the software Atlas.ti using both inductive and deductive approaches namely, open and closed coding. For the coding, the study accordingly formulated a code book and a code tree that has been envisioned into a code diagram, see Appendix I.

The map analysis will consist of thematic topographical maps displaying the hydropower dams in relation to the mainstream Lancang-Mekong watercourse derived from the figures in the AR (2019), ESAS (2019), SEA (2010), and XPCL (2021). The maps must therefore be thematic, visualizing hydropower constructions of the region, on a topographical base. The analysis of the maps shall be performed by visual analyses through the assessment of the technological, compositional, and sociality modality, as well as a thematic map analysis focusing on point, line, and symbolization interpretations (Rose, 2001, p. 29-30, Kimerling et al., 2016). In regard to Rose's visual analysis particularly the compositional and social modality will be used as these focus on uncovering the underlying meanings and notions behind the visualizations that are of interest to this study (Rose, 2001). The use of

map analysis will help visualize this study's query and provide an understanding of the proposition of the Lancang-Mekong River as a transboundary commons (Stokman & Pelger, 2020). This information, therefore, enables the visual analysis of the region along with the retrieved and analyzed documents to provide a comprehensive understanding of the transboundary commonality of the Lancang-Mekong River.

Validity, Reliability & Limitations

With the use of both document and map analysis and the utilization of various data sources, a triangulation strategy will be made use of hence resulting in the high validity for this study (Morgan, 2022). In regard to reliability, in order to assure consistency this query makes use of peer reviewing throughout the research and memoing during the analysis and coding processes (Creswell & Creswell, 2017). Limitations of this study are uncovered in the data collection methods as the English language cannot comprehend the full ontological understanding of the matter in comparison to the knowledge available in many local languages spoken around the Lancang-Mekong River basin. Another limitation is formulated by the nature of the analysis which shall mostly consist of writings from secondary or tertiary sources rather than primary ones, due to time and resource constraints. The use of secondary and tertiary sources means that this study will not be able to represent the local commonality of the Lancang-Mekong River, its focus shall hence primarily be national, and transnationally. However, the use of secondary and tertiary sources allows for interdisciplinary in-depth analysis (Creswell & Creswell, 2017). Given that this study makes use of document and map analysis, this study will make use of publicly available data sources as a result no private or sensitive information will be used or disclosed, the privacy and ethics checklist can be found in Appendix II.

Results

The findings and analysis of this paper will elaborate on the maps and documents interchangeably and aligned with one another. The thematic topographical maps will be referred to as figures and positioned in-text. The Lancang-Mekong River will generally be referred to in unison as "Lancang-Mekong", with the exception when analysis findings are reserved for the Lancang or Mekong exclusively. The findings shall initiate through the politics of water, followed by the understanding of the Lancang-Mekong River as a demarcated region, and finally a zoom-in on the reconfiguration of the river in terms of hydropower dams.

Hydro Politics of the Commons

The Lancang-Mekong River illustrates the inherently political nature of a river and the complexities surrounding its governance as the transboundary commons flows through the riparian states. This became visible through the analysis as there are various complexities surrounding the Lancang-Mekong River as a commons and its interaction with actors that are concerned with the governance of the watercourse. Particular relevant actors in this complex field of governance of the commons next to the riparian states themselves are private energy corporations, state-owned enterprises, local communities, and foreign investors such as the Mekong River Commission (MRC), China Huaneng Group (CHG), and Asian Development Bank (ADB). These parties are of additional interest given their unique roles regarding hydropower development in the Lancang-Mekong River, and the interests they serve.

The first hydropower dam built on the mainstream of the Lancang-Mekong River is the Manwan Hydropower Dam, built in China in 1986 (NIES, 2019). Ever since China has built six mainstream hydropower dams that are currently operational with an additional 15

dams being under construction according to the NIES (2019). One of the key actors in hydropower development in China, and in the Lancang River, is the state-owned enterprise, CHG, which also partakes in projects outside of China in for instance Pakistan, and Australia (CHG, 2019). The hydropower dams on the Lancang River, many of whom operated by CHG, are contested as the consequences they bring forth in relation to the food and livelihoods of those relying on the river (IR, 2014). The contestation is especially emphasized in terms of people living downstream, or Mekong River, as stated by the IR (2014), "Millions of villagers who live along the Mekong River grow vegetables in riverbank gardens and their livelihoods will be largely impacted if losing the gardens." (p. 1). The river here appears to be split along the Chinese border, with the consequences exclusively reserved for downstream countries rather than those living along the river as a whole. Hydropower development is not only undertaken in China but is correspondingly sought by nearly all riparian countries. Unlike in China, however, the field of actors involved in hydropower development is distinct as transnational cooperation, the MRC plays a big role in water management. The MRC is an inter-governmental river basin management organization, whose member states consist of four out of six riparian states namely, Laos, Thailand, Cambodia, and Vietnam. China and Myanmar are not part of the regional organization but are considered dialogue partners by the Commission (AR, 2016). The MRC member countries are located downstream of the river and are therefore also referred to as the Lower Mekong Basin (LMB), unlike China and Myanmar which are upstream nation-states making up the Upper Lancang (AR, 2017). Although China and Myanmar are not part of the MRC they are argued to have been increasingly open to providing the MRC with hydrological data in flood seasons according to the AR of 2012 (p.28). This is unlike the understanding of MEF (2020) which states that upstream countries in particular, China, are in a position of power due to the cascade of hydropower dams on the mainstream. The MEF (2020) exemplifies this by recalling the

severe drought in 2015 and 2016 caused by the super El Niño. The drought resulted in dropped water levels affecting the livelihoods and access to fresh water commons of millions of inhabitants (MEF, 2020). The MRC at the time requested China to release supplementary water from its dams in the Lancang to the Mekong as stated in the AR (2016),

> China implemented its emergency water supplementary release from its cascade dams in the Lancang River to the Mekong River by increasing the water discharge from Yunnan's Jinghong Reservoir in 'three phases': (1) from 9 March to 10 April 2016, with an average daily discharge of no less than 2,000 m3/s; (2) from 11 April to 20 April 2016 with the discharge of no less than 1,200 m3/s; and (3) from 21 April to 31 May 2016 with the discharge of no less than 1,500 m3/s. (p. 25)

Notable in this quote is the "release" of water, indicating it was trapped or perhaps enclosed to a certain extent implicating access to fresh water sources downstream. Additionally, the absence of 'hydropower' in front of the "cascade of dams" is noticeable. Perhaps this formulation is articulated with the purpose of removing hydropower from the implications the hydropower dams bring forth to the commons given the interest of the riparian countries to build hydropower dams themselves. The MEF (2020) states that regardless of the "[...] irreversible social and environmental impacts in the past years [...] more dams are being built and many more have been planned in the Mekong Basin, making it the world's most dam-dotted river basin." (p. 753). Of all riparian countries, especially prominent mainstream hydropower dam projects have been built by China and Laos as is seen in Figure 2 (XPCL, 2021, p.3).

Figure 2

Operational, under construction, and planned hydropower dams

The figure displays an oversimplified topographic base map in which the white line portrays the Lancang-Mekong River, which even though as a transboundary commons defies spatial permanence is displayed as a set line. The tributaries and thereby the terms of the scales of everyday human life are disregarded in their entirety allowing the dismissal of the local commons as a whole. The rectangular shapes diagonally crossing the river are representative of hydropower dams that are either operational, under construction, or planned. These rectangular shapes, appear to fragment the commons as the scale of the dams in comparison to the mainstream appears exceedingly large. The figure is found in the Greenbond Framework of the Xayaburi Power Company Limited XPCL (2021, p. 3), which is the power company responsible for the operation of the Xayaburi hydropower dam in Laos,

the first hydropower dam in the mainstream of the Lower Mekong River. The Xayaburi hydropower dam generates a total of 1285MW of which even though located in Laos, 1225MW is exported to Thailand and 60MW is sold to Laos by the Electricity Generating Authority of Thailand (EGAT) (XPCL, 2021, p. 2). Additionally, Thailand and Laos are most noticeable on the map given their colors, as opposed to surrounding nation-states which appear more faded earth tones. As simplified as the figure is, the map does not show any natural environment of the Lancang-Mekong basin, the river here is a mere location rather than a meaningful locale as it is to many communities. According to the SEA (2010), almost 30 million people live and work within a radius of 15 km of the Mekong River, and around 2 million are local riparian communities "[...] who are expected to be most at risk to the direct and indirect impacts of the LMB mainstream dams." (p. 16). Those directly affected, an estimated 100.000 people, are required to resettle, losing their homes and land (SEA, 2010). These people are thereby being excluded from access to the commons due to transnational governance of the commons. The XPCL (2021) confirms the direct impacts and adds it will be providing compensation for "[...] direct loss of houses, gardens, farmland, or other infrastructure [...]." (p. 10). This becomes more ambiguous as the XPCL (2021) further states "[...] XPCL's engagement with the PAPs and the communities did not end with the successful relocation or the completion of the construction activities but remains for more than 10 years into the operation of the plant." (p. 10). In this quote, PAP stands for Projects Affecting People, and it appears that the XPCL failed to manage its compensation for people affected by the hydropower dams, although as is seen in Figure 2, the Xayaburi hydropower dam is currently operating. This raises questions in terms of who gets access, who is excluded, and who has the power to control this, especially in regard to the millions of individuals facing indirect consequences of the mainstream dams that are not accounted for.

The Xayaburi dam is additionally the first hydropower dam consulted by the MRC, whom the XPCL had to comply with in regard to hydropower design guidelines (MRC, 2012). The MRC (2012) states that the Xayaburi dam is a sensitive case due to public concerns so the MRC provided "valuable technical input" to the Prior Consultation and Agreement Process (PNPCA), and the Preliminary Design Guidance (MRC, 2012, p. 1). This input is further not elaborated on and as mentioned, the hydropower dam is currently operating, the MRC in this sense does not indicate to conform to public concerns yet the MRC is expected to represent their riparian communities. Notably, the MRC refers to itself as "Entrusted as the "manager of the river" [...]" (AR, 2017, p. 69; AR, 2018, p. 45). With the MRC perceiving itself as foremost "entrusted" and "manager of the river" it appears to assume a legitimate ownership over the transboundary commons. This notion of ownership is confirmed in the AR (2018) where it refers to the development and management of the Mekong basin. This poses contradictions regarding the governance of water particularly representing national interests relative to hydropower dams on the mainstream Mekong. The MRC addresses that its pursuit of cooperation in terms of water governance in the midst of the surrounding differing national interests and priorities is challenging (AR, 2018). These challenges have further not been elaborated upon however, a challenge for each of the member states that has been addressed frequently throughout their ARs is the intersection of hydropower development and the transboundary environmental impact, as was perceived with the Xayaburi hydropower dam construction.

It should be noted that documents regarding the assessment of the hydropower dams built on the mainstream Lancang were published by international corporations whereas this study sought to also highlight national assessments. These were however not easily found or accessible as for instance, the Chinese National Committee on Large Dams' reports required payment, and no VPN connection could be used. The papers that have been analyzed

however interestingly reveal how demarcated the river becomes as it crosses state boundaries, the commons appear to become fragmented due to these spatial arrangements. Hydropower dams, in general, negatively affect the river as a commons and the environment as a whole as stated by Middleton (2022), however, the emphasis was applied on the upstream cascade of dams whereas in the meantime Thailand and Laos are seeking to construct their own hydropower dams. As argued by Allouche (2020) given that water defies fixity, the watercourse of the Lancang-Mekong is perceived to be interpreted according to its (potential) uses by different actors that have to authority to exert power on this. Due to the lack of fixity and fluid spatiality enclosing a common is not easily achieved, however access to the commons can be restricted thereby excluding people from the commons (Yong, 2022). In the Lancang-Mekong River, this exclusion is explicit as people were forced to relocate due to the hydropower dams access here is controlled by its governing authorities. However paradoxically, the idea of shared ownership in terms of a transboundary river implies its commonality as the governance of the river lies with the representatives of the riparian countries. Although, the moment these parties serve specific interests the river's commonality again becomes contested. This was perceived with the Xayaburi hydropower dam where millions of people were assessed to be at risk of the direct and indirect impacts of the dam, losing their lands and homes, with compensation processes unrevealed. Assessments of how hydropower development affects the commons is therefore fragmented as is the interpretation of the Lancang-Mekong River.

Demarcated Places

The Lancang-Mekong River is a large landscape attribute that compiles configurations of the river's materiality and the complex governance that surround it. The borders or, spatial governing arrangements, through which the transboundary commons such as the

Lancang-Mekong River traverses have the ability to control and thereby demarcate access to the commons (Miller, 2020). The borders of the Lancang-Mekong riparian countries themselves are therefore considered key actors in managing spaces and access. This is perceived with the Lancang-Mekong River appearing to become increasingly fragmented according to its national contexts and increasing hydropower development undertakings. Topographical maps are key to visualizing this spatial fragmentation, prominent demarcated understandings of the river are hence portrayed in topographical maps as was seen in Figure 2. Many of the analyzed documents used topographic maps as a means to represent and locate hydropower developments on the river however the underlying spatial propositions of the commons are accordingly made visible.

In the Annual Report from 2017, the MRC elaborated on its governance relative to the transboundary river,

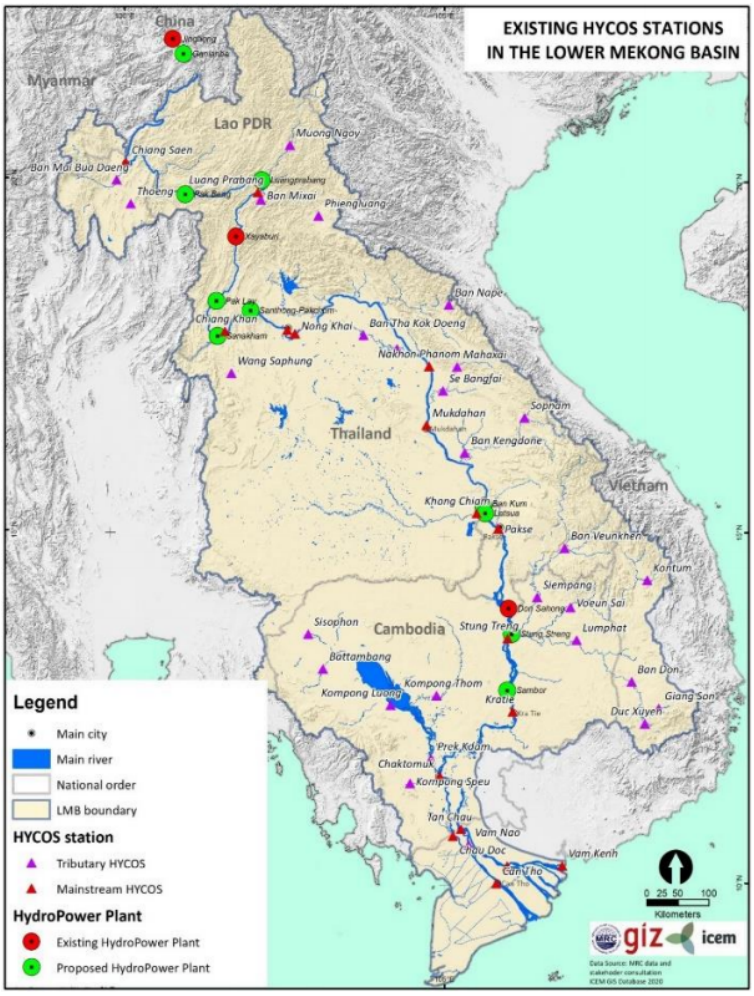
> Although the Upper Mekong (called Lancang in China) and the Lower Mekong are one transboundary river, only the four Lower Mekong riparian states became members of the Mekong River Commission (MRC) when it was established by the 1995 Mekong Agreement. (p. 45)

The quote conveys the MRC's imaginaries of the river, particularly when the river is referred to as "one transboundary river" and "Lancang" is replaced with "Upper Mekong" (AR, 2017, p. 45). The dual connotation regarding the Lancang implies becomes evident here. The transboundary river here is perceived as one namely the Mekong, made up of the Upper and Lower segment, implying the commonality of the transboundary river. However, in the same paragraph, when concerns about these commons are addressed the Upper Mekong is called by its Chinese title, "[...] from the Commission's point of view, questions remain concerning developments in the Lancang River and their effects on the countries and people downstream." (AR, 2017, p. 45). The developments addressed here are hydropower dams

build on the mainstream of the Lancang as becomes clear in the following page of the AR (2017, p. 46). The separation between the Lancang and the Mekong is also visualized in the topographic maps in the ARs as shown below in Figure 3, derived from the AR of 2019 (p. 34),

Figure 3

Hydropower, and HYCOS in "Lower Mekong Basin"



Titled "Existing HYCOS stations in the Lower Mekong basin", the figure shows the hydrological cycle observing system of the Mekong (HYCOS). The source, "the MRC data and stakeholder consultation KEM GIS database 2020" is seen in the right bottom corner, with the stakeholders, the MRC, GIZ (German Agency for International Cooperation), and ICEM (International Centre for Environmental Management), being visible. The GIZ is a

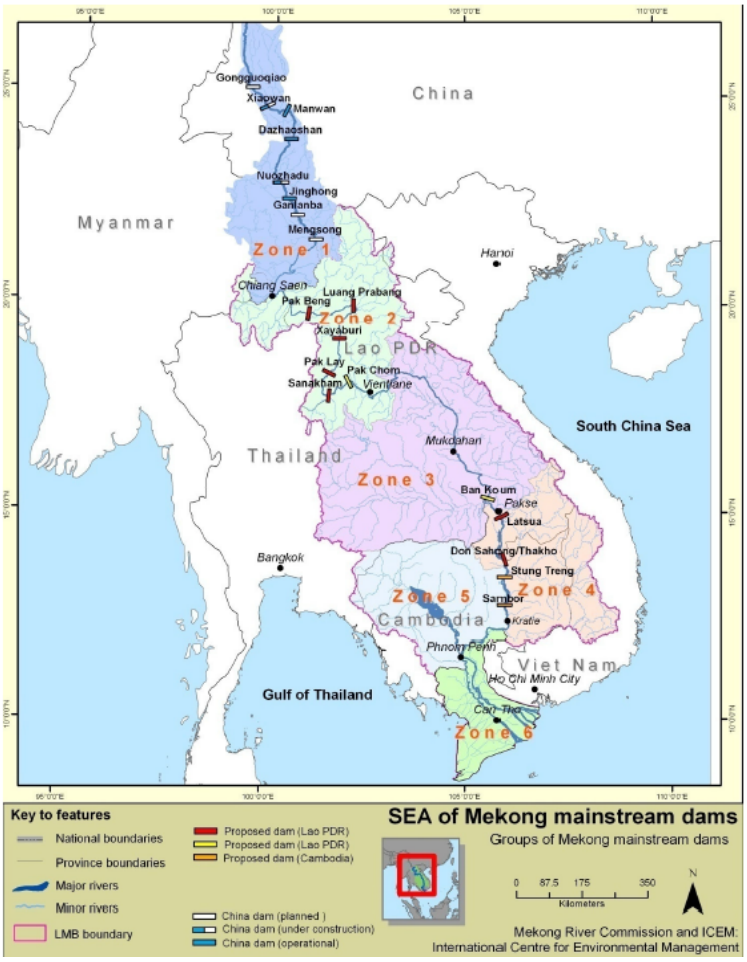
funding partner to the MRC, and the ICEM is further not mentioned in the document. The HYCOS was set up as a means to determine the "transboundary impacts of mainstream hydropower projects, and to distinguish project-specific induced changes to the basin from the cumulative basin-wide impacts of all other developments." (AR, 2019, p. 33). As such the Figure shows the HYCOS stations on a schematic topographical base map that includes the variations in the elevation of the surface ground, also called relief. The depiction of the HYCOS stations along the mainstream implies a notion of control as the commons here is depicted as an entity to which changes are made and therefore needs to be kept an eye on. The MRC, as previously stated, is concerned with the hydropower development in the Lancang mainstream, yet hydropower projects are increasingly embarked upon as is seen in Figure 3 by the green dots, "Proposed hydropower Plant" in the mainstream. The authority to 'develop' the commons then seem reserved for the ones who are privileged to *not* be concerned with the negative consequences of increasing control of the commons. The phrasing here is essential in understanding how the LMB appears to confine itself from the Lancang - as the Lancang is an area of concern, and the Mekong an area of development - with the implications hydropower projects inflict being labeled as "induced changes" (AR, 2019, p. 33). The MRC appears to distinguish the impacts of hydropower development in the mainstream of the commons from "other development" (AR, 2019, p. 33). Additionally, on the base map, a yellow-beige colored area stands out marking the "LMB boundary". The colored area does not cover the complete land masses of the riparian states, rather it specifically outlines the mainstream Mekong and its main tributaries. The LMB boundary here, next to the nation-state borders acts as additional spatial arrangements by which the transboundary commons can be defined and governed. The figure also depicts existing and proposed hydropower plants using red and green circles. These circles are also seen outside

of the LMB boundary in China, however, the river here is not highlighted, appearing obscure in contrast to the blue highlighted line indicating the commons, or in this case "main river".

Although the terms, upstream and downstream, are relational to rivers the terminology upstream in the presence of water governance in the Lancang-Mekong, appears to refer to the area of the river that lies within China exclusively. The moment the transboundary commons crosses borders, or governed spatial institutions, flowing into Laos, the downstream is marked and the Lower Mekong Basin is manifested and outlined. This can be perceived in the topographical map illustrated in the SEA (2010, p.13), see Figure 4 below. The SEA was conducted by the International Centre for Environmental Management (ICEM) for the MRC, and stated that "The proposed mainstream hydropower represents a fundamental break from the current dynamic equilibrium of the Mekong River which converts the immense potential and kinetic energy of the system into a wide range of eco‐morphological processes along its entire length." (SEA, 2010, p. 12). The quote illustrates the acknowledgment of the implications hydropower dams realize whilst simultaneously referring to this river as a system diminishing it from its natural environment and thereby its nature as a commons. The river becomes exclusively reserved for its "immense potential and kinetic energy" rather than a shared resource for not only the riparian countries but also its communities.

Figure 4

The Lancang-Mekong mainstream hydropower dams



This map found in the SEA (2010, p. 13), titled “The LMB mainstream reservoirs: 55% of the Mekong River (Chiang Saen to Kratie) will be converted into reservoirs." shows, “proposals located in three distinct hydro‑ecological zones and assesses them in five different dam groupings." (SEA, 2010, pp. 12, 13). The title is, in particular, interesting as it confirms the enclosure of the commonality of the Lancang-Mekong to a certain extent. The map visualizes this as, the Lancang-Mekong River is derived from its riparian states and displayed as a separate region that is further demarcated from one another as close to the state borders of Myanmar and China the area is further divided and referred to as "Lower Mekong Basin" (LMB), by the pink outline named "LMB boundary". The Lancang-Mekong River basin is additionally divided into distinctive colorful zones as opposed to the solid white

topographical base map, fragmenting and transnationally enclosing the commons to a greater extent. The figure also displays hydropower dams that are proposed, planned, under construction, and operational in the form of rectangular spheres diagonally interrupting the mainstream or "major rivers". The map stems from the SEA, which was published in 2010, noticeable is that the hydropower dams that are operational and under construction at that time were only found in China and Myanmar whereas, the LMB only depicts proposed hydropower dams, all proposed by Laos. Unlike this map, Figure 3 was derived from a later published report and shows the hydropower dams in Laos have been constructed in the meantime. Both figures however show distinctive propositions of the commons as visualizations of the social imaginary, the LMB is enforced. The dual understanding of the river, the Lancang and the Mekong, not only indicates a demarcation in the understanding of the shared transboundary common but also allows the consequences of hydropower dams on the mainstream to be condemned on the produced spatial arrangements rather than the hydropower dams itself. This is further observed in the MEF (2020),

> In a geopolitical showdown, the Chinese government appears to believe that Mekong water is a sovereign resource rather than a shared resource, placing the downstream governments' needs to secure free access to international water resources, biodiversity conservation, and food security at risk (Quang 2017b). (p. 753)

The MEF was published in 2020, and as was seen in the topographical map from AR of 2019, the hydropower dams in the mainstream Mekong in Laos were already operating. Although the MEF (2020) here acknowledges the commonality of the transboundary river and its cruciality in assuring access to the river, the exclusion risk comes from hydropower dams but solely from the ones operating in China.

As mentioned by Thomas (2021), rivers are large landscape attributes that hold the ability to demarcate territories from one another. The demarcation of places allows

nation-states to exert power over the commons by coinciding with what falls within their authority as property rather than a commons (Rogers et al., 2023; Zeitoun & Warner, 2006). The Lancang-Mekong River is one waterway flowing from the mountains in Tibet through its riparian states into the South China Sea. Yet the river tends to be distinguished by its up- and downstream topographical locale with nation-state borders acting as the demarcation of spaces. The river becomes split into Lancang or Mekong, where underlying landscape attributes further split the river into fragments. Places and people accordingly become increasingly separated from one another with those concerned with the governance of the Lancang-Mekong River as a transboundary commons, enhancing this by producing these spatial understandings as argued by Miller (2020) and Stokman and Pelger (2020). The river hence is not one transboundary commons flowing from the mountains into the sea, rather it becomes an entity to be derived from its environment for effective control, by governing and the "development" of the river.

Blueprinting The Lancang-Mekong

The Lancang-Mekong River is not only subject to governing complexities but is simultaneously demarcated from nature due to the river's hydropower-generating abilities. Over time this may imply the watercourse itself being continuously viewed as an entity separate from its environment as a transboundary commons, and thereby transformed into a hydropower generating system that can be exploited for the nation-states' benefit. This is in particular visible in a quote from the SEA (2010) which illustrates the transformation regarding hydropower dams as the report states

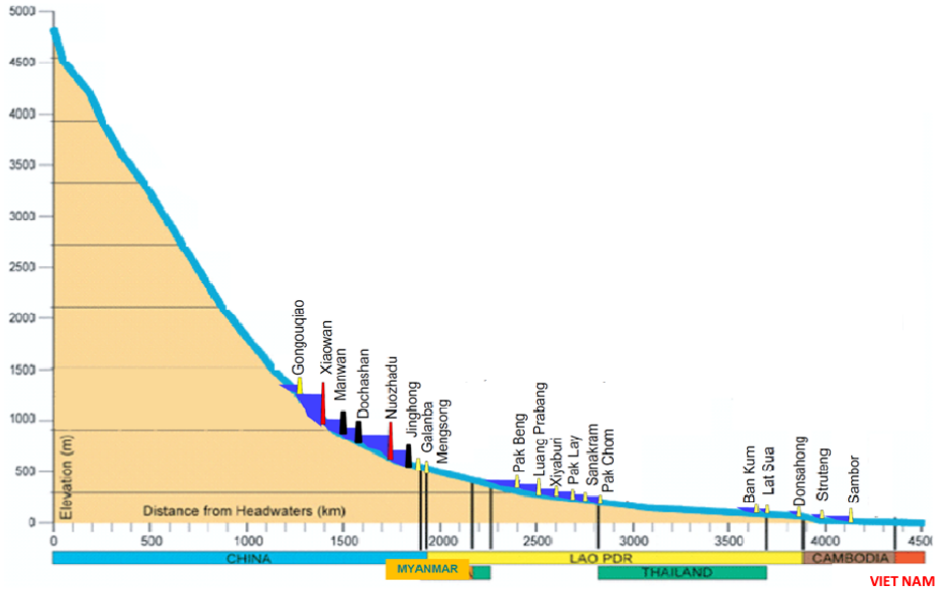
> The Lower Mekong Basin (LMB) is emerging as one the most active places in the world for hydropower development. This massive energy potential remains largely

> unharnessed and can boost economic growth, alleviating poverty and providing socio-economic opportunities. Harnessing this huge capability is a key driver in economic and social development. (p. 36)

The river is not explicitly mentioned here, rather the basin itself was referenced and the focus on "massive energy potential" and "huge capability" here appear to have replaced the river as a commons and diminished it into a power-generating capability. Separating the river from its natural environment and perceiving it as a distanced entity enable the commodification of the river. This is further perceived by the context in which "harnessing" is used, the transboundary commons become an item to be harnessed and extract from. The abstraction of the natural environment and increasing commodification is visualized in the SEA (2010, p.6) where the river is derived from its geographical materiality and quantified into a thematic map, see Figure 3.

Figure 5

Proposed mainstream hydropower dams



As is seen in Figure 5 the topographic environment is entirely diminished into a graph with the y-axis illustrating the elevation and length of the river over the course of the riparian

countries, the x-axis. The light blue curve here is representative of the mainstream of the river and the vertical black lines intersecting the blue curve from the x-axis are nation-state borders. Further seen are black, red, and yellow stripes going up from the light blue curve representing the proposed hydropower dams and their ambiguous locations. Again borders appear to be of importance given it is the sole topographical indicator next to the mainstream curve. The dark blue color filling the gaps between the hydropower dams represents the water storage reservoirs of the dams (SEA, 2010, p. 6). The figure in the SEA (2010), is titled "Proposed Mekong mainstream hydropower projects in the LMB and Yunnan Province, China" (p. 6). This figure is exemplary in showcasing how transboundary commons are not illustrated as such but rather viewed as an entity. What can be seen in this figure, the complete removal of the topographical environment illustrates the proposition of the commons by the map producers as visualizes exclusion and transnational enclosure. Some of the proposed hydropower dams seen in this figure are currently operating as can be seen in figure 2 and 3. In addition to the Lancang-Mekong River being viewed as a tool for generating hydropower, the river is also seen as a tool to benefit the countries and the people as the MRC states it seeks to, "[...] promote and coordinate sustainable management and development of water and related resources for the countries' mutual benefit and the people's well-being." (AR, 2011, p. 3). There is a focus on the mutual benefits of countries and people's well-being here indicating the shared benefits of the commons. The governance surrounding the Lancang-Mekong River articulates the river as a resource to be harnessed and to extract benefits from it whereas, the benefits are to be for the countries' mutual benefit and for the people's wellbeing. However, no records that hydropower development has been beneficial to the people's well-being were shown.

In China, according to the CHG (2019), the commodifying notions of the Lancang-Mekong River appears to have been prominent since the 1980s as it is stated that,

"In the late 1980s, Lancang River was listed as one of the top 12 hydropower bases." (p. 68). The river here is diminished into hydropower "bases", a mere platform for generating "national economic growth" as becomes visible in the paragraph (CHG, 2019, p. 68). Notably, when centering Laos the only country next to China with operating hydropower dams in the mainstream of the Lancang-Mekong River, the commodification of the river appears similarly. In the Annual Report of 2016, an instance of this is observed as it refers to the exploitation of the river, "Unsustainable exploitation of the resource base will increase Lao PDR's economic vulnerability and will eventually have an impact on its economy if natural resources remain a dominant source of growth and other sectors clearly lag behind" (p. 16). The quote is focused on Laos which in the past years has increasingly engaged in the construction of hydropower dams on the mainstream of the Lancang-Mekong River. According to this quote, the river is referred to as a resource base that Laos' economic development is dependent on, and its "unsustainable exploitation" threatens its economy (AR, 2016). Compelling here is the term unsustainable exploitation as it appears to imply the existence of a sustainable manner for the exploitation of the commons. In a description of the operation of the hydropower dam Xayaburi in Laos the XPCL (2021), states,

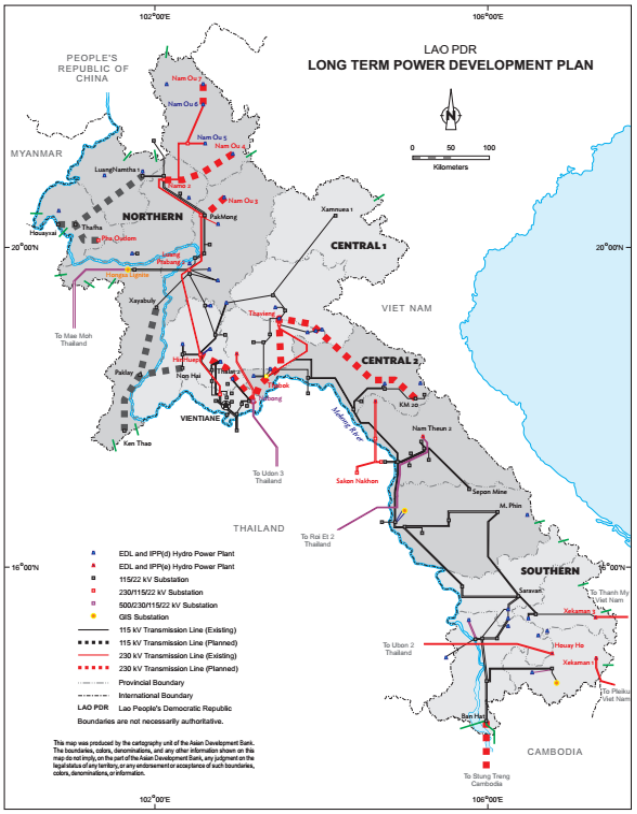
> The power production of the plant follows the river flow. The upstream water level is maintained at 275.00 +/- 0.5 mm asl (normal operating level). Power production for the EGAT units has to be declared in advance following agreed procedures between XPCL and EGAT. In order to maximise declared power, a specific flow forecasting system was installed by XPCL. (p. 4)

The river's water flow here is a mere power-producing entity quantified and maintained by forecasting devices installed by the XPCL. Water here appears static, unlike its defiance of fixity as is perceived with commons. Additionally, in the ESAS (2019) which is centered on the assessment of energy in Laos, seen is in how institutions such as the ADB proposition the

transboundary commons. In Figure 6 below a topographical map of Laos is depicted and titled "Long term power development plant" (ESAS, 2019, p. 39)

Figure 6

Laos as a technical drawing



Given that the ESAS is focused on Laos, its neighboring countries are diminished into a solid white base map in which only Laos's borders are illustrated. The map shows the hydropower plants from the EDL, the central energy corporation of Laos, in blue squares and red triangles. The transmission lines are seen to reach the country of Laos itself as well as passing borders into the neighboring countries which mostly go into Thailand and a single instance into Cambodia. The mainstream in this map is presented by a blue line with the transmission lines expanding from the mainstream, appearing to display the commons as a conductor for electricity. The map itself appears as a national scale blueprint centering the Lancang-Mekong River. The commons here appear almost fictitious as the illustration portrays the river as something that is owned by the XPCL as they build large infrastructures

around it containing the commons to a privatized property of the hydropower development company.

In the SEA (2010), ARs (2011; 2012; 2016), ESAS (2019), and CHG (2019) the perception of the commons as a property, a mere commodity for hydropower generation, is recurringly connotated in the maps and documents. The phenomenon of deriving the natural environment from the Lancang-Mekong River is argued by Choi (2016) and Green and Baird (2016) as the commodification of a resource in order to extract monetary value from it. Notably all analyzed documents except the MEF (2020), perceived the river as an entity to be governed. The MEF (2020) differed from this by instead focusing on the Lancang-Mekong River as a crucial ecosystem that provides and sustains life, and spatial power interactions and environmental implications the river as a common resource brings forth. It puts great emphasis on spatial power arrangements, or upstream, and downstream interactions. However, similarly to the ARs, its commonality is reserved for the Mekong, not the Lancang.

Discussion & Conclusion

For the analysis, five maps and fifteen documents have been analyzed to assess how the building of hydropower dams in the mainstream of the Lancang-Mekong reconstructs the river as a transboundary commons. As such this study acknowledges In the result section, it was perceived that the Lancang-Mekong River is subject to complex governances and spatial arrangements, that exert power on the river and assume its spatial permanence and thereby the commons. As such the Lancang-Mekong River's commonality appears rather suggestive relative to its transnational governance. To date, China and Laos are the only countries that built hydropower dams on the mainstream of the Lancang-Mekong River. It should be noted that documents regarding the Lancang in particular were not as accessible leading to a limited representation of in particular China. Additionally, there is "one" transboundary river the moment it serves transnational hydropower development, however, whenever the implications of particular hydropower dams in China, are mentioned the Mekong River becomes fragmented from the Lancang River, even though Laos also constructed hydropower dams on the mainstream.

The fragmentation of transboundary commons is further enhanced by positioning the river as such in thematic topographical maps, reproducing demarcated spatial understandings, and dismissing the river as one transboundary commons. The figures used in this analysis displaying thematic topographical maps, all have in common that the Lancang-Mekong River which in nature is a transboundary commons is not portrayed as such. The maps which have been derived from the SEA (2010), ESAS (2019), AR (2019) and XPCL (2021), have all been produced by stakeholders of those involved with the governance and hydropower development of Lancang-Mekong River. The maps therefore serve in the interest of these actors displaying the transboundary commons as such in their maps. The river becomes

diminished from its natural environment and transformed into an entity to be harnessed and from which hydropower can be abstracted, thereby implicitly indicating who has control of the commons and who gets to have access or not.

This raises the question of to what extent the ARs, environmental impact assessments, and reports made by governing institutions and power companies really translate the understanding of the Lancang-Mekong River as a commons, as opposed to those depending on the river's commonality for their livelihoods. The river appears to be solely governed by institutions and corporations concerned with the river's commodity, and its hydropower generating ability, such as the ADB, MRC, XPCL, and CHG. These actors have the power to dismiss the commonality of the river, thereby denying access and excluding people from the commons, as was seen with the forceful relocation due to the Xayaburi hydropower dam in Laos. Out of all documents analyzed primarily the MEF (2020), managed to take into consideration the way the river shapes local lives and cultures. However just as the other documents the MEF (2020) reproduces spatial power dynamics and national borders which further authorize nation-states and institutions to exert control over the commons. It can therefore be stated that analyses have demonstrated that the commonality of the Lancang-Mekong River is contested.

On a transnational scale, the idea of shared ownership of a multinational commission such as the MRC implies a specific extent of commonality as the governance lies with the representatives of its riparian states. However, the moment these representatives serve the interest that implies the denial of access and thereby the exclusion to the commons its shared ownership proves to be paradoxical relative to the commons. In addition to this given that riparian states still have an artificial authorization over the river due to constructed nation-state borders transnational exclosure can be manifested as was seen with the El Nino, when the MRC had to request China to release supplementary water of its cascades of

hydropower dams in the mainstream to ensure access to its riparian communities. Simultaneously the water flowing through the Lancang-Mekong River may be considered by its commonality nonetheless as water flows cannot fully be enclosed given that water defies fixity and the time and spatial understandings of capitalist projects.

Therefore, to answer the research question, the building of hydropower dams in the mainstream of the Lancang-Mekong River reconstructs the river as a transboundary commons by allowing those involved in the hydropower development in the commons the authority to confer who gets access to the river and who gets excluded. The commonality of the river, therefore, becomes contested and subject to transnational enclosure. The Lancang-Mekong River, which although by nature is a commons and can never be fully enclosed, will not be perceived as such. Rather the Lancang-Mekong River becomes fragmented, diminished from its environment, and finally perceived as a mere resource from which value can be extracted transforming the transboundary commons into an increasingly enclosed hydropower generating entity.

Recommendations

As mentioned, due to time and resource constraints this research was unable to represent the riparian communities and examine the commons to a greater scale. The limitations of this study can be translated into recommendations for future inquiries. In order to assess how hydropower dams reconstruct the commons with an emphasis on its riparian communities, field research in riparian countries, that also include China, can be conducted. As such localized knowledge can provide as valuable knowledge for the implications hydropower dams bring forth. The scales of the everyday-life will then also be visible and by means of participant mapping be reproduced in thematic topographical maps fitting the interest of the people.

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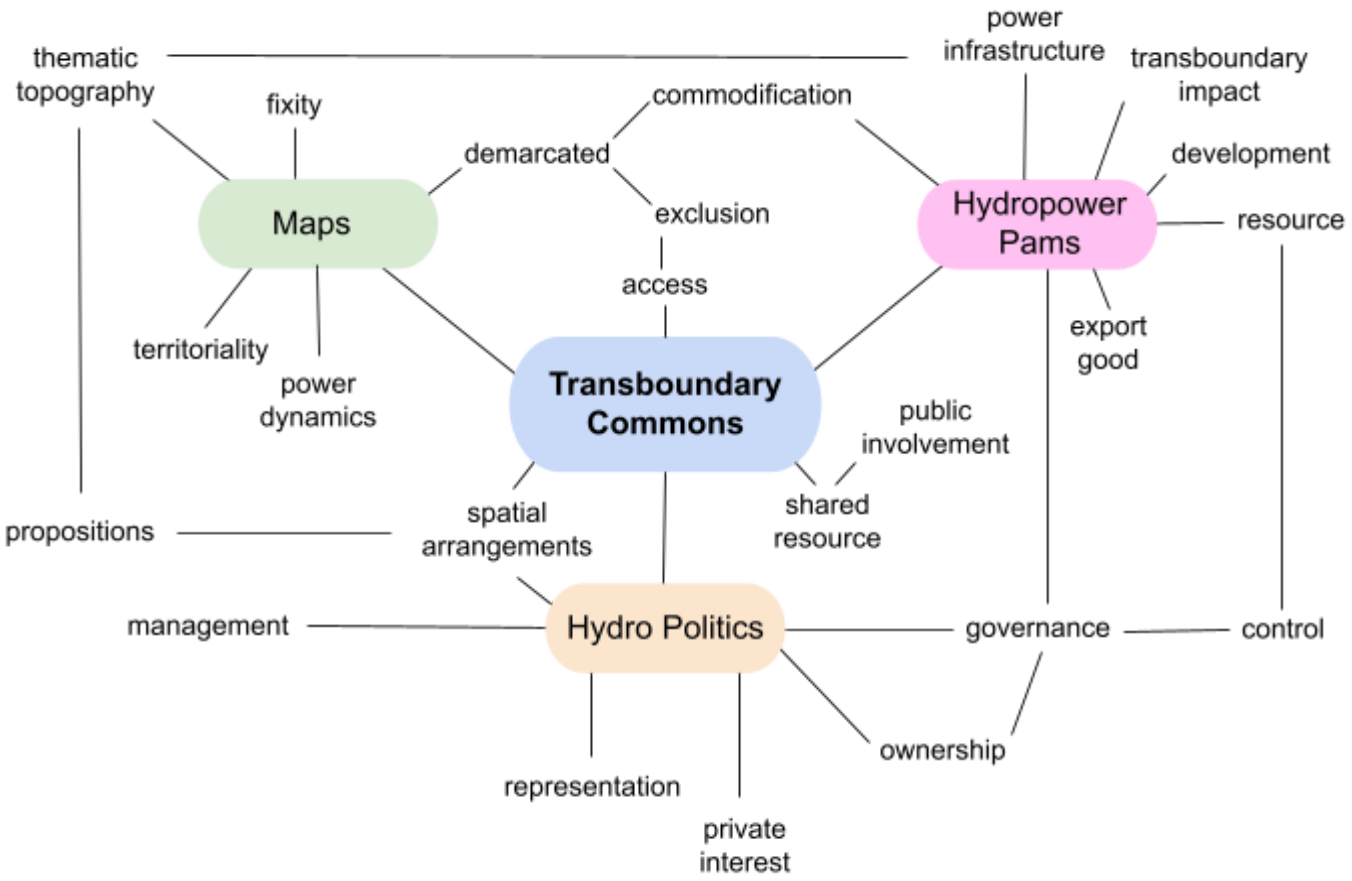
Appendices

I: Code Diagram



II: Privacy and Ethics Checklist

CHECKLIST ETHICAL AND PRIVACY ASPECTS OF RESEARCH

INSTRUCTION

This checklist should be completed for every research study that is conducted at the Department of Public Administration and Sociology (DPAS). This checklist should be completed *before* commencing with data collection or approaching participants. Students can complete this checklist with help of their supervisor.

This checklist is a mandatory part of the empirical master's thesis and has to be uploaded along with the research proposal.

The guideline for ethical aspects of research of the Dutch Sociological Association (NSV) can be found on their website (http://www.nsv-sociologie.nl/?page_id=17). If you have doubts about ethical or privacy aspects of your research study, discuss and resolve the matter with your EUR supervisor. If needed and if advised to do so by your supervisor, you can also consult Dr. Bonnie French, coordinator of the Sociology Master's Thesis program.

PART I: GENERAL INFORMATION

Project title: Enclosing the Commons?: Hydropower Dams in the Lancang-Mekong River

Name, email of student: Yasmin Sebaihi, 531842ys@eur.nl

Name, email of supervisor: Willem Schinkel, schinkel@essb.eur.nl

Start date and duration: February - June 2023

Is the research study conducted within DPAS ***YES*** - ~~NO~~

If 'NO': at or for what institute or organization will the study be conducted?

(e.g. internship organization)

PART II: HUMAN SUBJECTS

1. Does your research involve human participants. ~~YES~~ - ***NO***

   If 'NO': skip to part V.

   If 'YES': does the study involve medical or physical research? YES - NO

   Research that falls under the Medical Research Involving Human Subjects Act (WMO) must first be submitted to an accredited medical research ethics committee or the Central Committee on Research Involving Human Subjects (CCMO).

2. Does your research involve field observations without manipulations

   that will not involve identification of participants. YES - NO

   If 'YES': skip to part IV.

3. Research involving completely anonymous data files (secondary data that has been anonymized by someone else). YES - NO

   If 'YES': skip to part IV.

PART III: PARTICIPANTS

1. Will information about the nature of the study and about what participants can expect during the study be withheld from them? YES - NO

2. Will any of the participants not be asked for verbal or written 'informed consent,' whereby they agree to participate in the study? YES - NO

3. Will information about the possibility to discontinue the participation at any time be withheld from participants? YES - NO

4. Will the study involve actively deceiving the participants? YES - NO

Note: almost all research studies involve some kind of deception of participants. Try to think about what types of deception are ethical or non-ethical (e.g. purpose of the study is not told, coercion is exerted on participants, giving participants the feeling that they harm other people by making certain decisions, etc.).

5. Does the study involve the risk of causing psychological stress or negative emotions beyond those normally encountered by participants? YES - NO

6. Will information be collected about special categories of data, as defined by the GDPR (e.g. racial or ethnic origin, political opinions, religious or philosophical beliefs, trade union membership, genetic data, biometric data for the purpose of uniquely identifying a person,

data concerning mental or physical health, data concerning a person's sex life or sexual orientation)? YES - NO

7. Will the study involve the participation of minors (<18 years old) or other groups that cannot give consent? YES - NO

8. Is the health and/or safety of participants at risk during the study? YES - NO

9. Can participants be identified by the study results or can the confidentiality of the participants' identity not be ensured? YES - NO

10. Are there any other possible ethical issues with regard to this study? YES - NO

If you have answered 'YES' to any of the previous questions, please indicate below why this issue is unavoidable in this study.

What safeguards are taken to relieve possible adverse consequences of these issues (e.g., informing participants about the study afterwards, extra safety regulations, etc.).

Are there any unintended circumstances in the study that can cause harm or have negative (emotional) consequences to the participants? Indicate what possible circumstances this could be.

PART IV: SAMPLE

Where will you collect or obtain your data?
Note: indicate for separate data sources.

What is the (anticipated) size of your sample?
Note: indicate for separate data sources.

What is the size of the population from which you will sample?
Note: indicate for separate data sources.

Part V: Data storage and backup

Where and when will you store your data in the short term, after acquisition?

For my thesis, I will conduct document and map analysis hence making use of digital data files only. All data relevant to my thesis will be stored on my laptop.
Note: indicate for separate data sources, for instance for paper-and pencil test data, and for digital data files.

Who is responsible for the immediate day-to-day management, storage and backup of the data arising from your research?

I am personally responsible for all data management.

How (frequently) will you back-up your research data for short-term data security?

The data is manually and automatically backed up with every alternation made.

In case of collecting personal data how will you anonymize the data?

The nature of my study does not require any collection of personal data.

Note: It is advisable to keep directly identifying personal details separated from the rest of the data. Personal details are then replaced by a key/ code. Only the code is part of the database with data and the list of respondents/research subjects is kept separate.

PART VI: SIGNATURE

Please note that it is your responsibility to follow the ethical guidelines in the conduct of your study. This includes providing information to participants about the study and ensuring confidentiality in storage and use of personal data. Treat participants respectfully, be on time at appointments, call participants when they have signed up for your study and fulfil promises made to participants.

Furthermore, it is your responsibility that data are authentic, of high quality and properly stored. The principle is always that the supervisor (or strictly speaking the Erasmus University Rotterdam) remains owner of the data, and that the student should therefore hand over all data to the supervisor.

Hereby I declare that the study will be conducted in accordance with the ethical guidelines of the Department of Public Administration and Sociology at Erasmus University Rotterdam. I have answered the questions truthfully.

Name student: Yasmin Sebaihi

Date: 26/03/2023

Name (EUR) supervisor: Willem Schinkel

Date: 26/03/2023