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Hydropower infrastructure and regional order making in the Sub-Mekong region

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Abstract

This paper conceptualizes the interplay between infrastructures and the reconstruction of regional order. We analyze the promotion of hydropower development in the Greater Mekong Sub-Region in relation to the potential emergence of a Chinese hegemony. Dams, electricity grids and monitoring systems have enabled cross-border linkages and dependencies, enmeshing Chinese actors in various places, markets, and knowledge systems. Yet knowledge controversies over impact assessments and diverging sociotechnical imaginaries indicate that it is too early to talk about a China-centered regional order.

Keywords: Sociotechnical imaginaries, Hydropower Infrastructure, Greater Mekong Sub-Region, Chinese hegemony

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China's infrastructural turn

Infrastructures have clearly moved to the center stage of China's regional and global policies. In October 2013, Chinese President Xi Jinping gave a historic speech at the outset of his first official tour through Southeast Asia. Before the Indonesian House of Representatives, Xi stressed the “closely-knit China-ASEAN community of common destiny,” and proposed a “maritime partnership in a joint effort to build the Maritime Silk Road of the 21st century” (ASEAN-China Center 2013). In subsequent remarks, China's president stressed his goal to “break the connectivity bottleneck” in Asia (China Daily 2014). This rhetoric is backed up by numerous large-scale projects. In Sri Lanka, Pakistan, and various African countries, Chinese contractors invest billions to build deep-sea ports and adjacent transport corridors. Among the most ambitious projects are a 5000 km high-speed rail system that, when completed, will connect more than 20 Asian countries (Xinhua 2015). The second phase of the Beidou satellite system

offers GPS services for Asian customers and an undersea cable that will link the netizens of all BRICS countries directly for the first time.

A modest approach that began as “road diplomacy” roughly ten years ago (Garver 2006, Holslag 2010) developed into a comprehensive initiative promoting China’s global connections. At the core is an orchestrated attempt to create the “Silk Road Economic Belt” and the “21st Century Maritime Silk Road” (Reuters 2014). The so-called “One Belt and One Road” (OBOR), fully unveiled at the 2014 APEC Summit in Beijing, aims at nothing less than establishing a web of traffic, transport, and communication networks and linkages between China and its neighboring regions, including Central Asia, the Russian Far East, Southeast Asia, and ultimately European markets.¹ The necessary financial backbone will be provided by several new China-led funding institutions, most notable the \$40 billion Silk Road Fund and the \$100 billion Asian Infrastructure Investment Bank. The task of both agencies is to use their financial instruments for creating “connectivity partnerships” – which constitutes a considerable challenge, not least to such well-established institutions as the World Bank and the Asian Development Bank (Xinhua 2015, Bretton Woods Observer 2014).

China’s infrastructural turn has generated sweeping claims. For some observers the days have finally come when China openly pursues its hegemonic ambitions, trying to reshape the global economic order according to its own grand strategy (The Huffington Post 2015; The Wall Street Journal 2014; The Diplomat 2014). A Berlin-based think tank notes that China is creating “parallel structures,” stating that this would challenge the economic world order (Merics 2014). The intuition that new infrastructures facilitate the making of a “new order” does not seem too far-fetched (Godehard 2014). Yet, we want to strike a more cautious note because facts, fears, and dreams appear to be, for the moment, intractably mixed up. A systematic treatment of the successes and implications of these policies and investment initiatives is still pending, not least because the role of infrastructures is only slowly acknowledged and hardly theorized within current International Relations (IR) debates about China’s rise.

Considering the power transformation within the region and Chinese activities, aiming to enhance its influence, predictions were made about changing regional hierarchy. Whatever the shape of the future regional order, China is always among the most important concerns (Shambaugh 2006, Goh 2011, 2013). Some highlight Beijing’s ability to become a new ruler of the world, whereas others cautiously emphasize the gap between China’s real and assumed influence (Goh 2011, Shambaugh 2013, Dorsch 2007, Truong-Minh 2014). But while the debate about China’s ability and ambitions to reshape regional order in Southeast Asia is longstanding (Dorsch and Vuving 2008, Burgos and Ear 2010, Baviera 2012), the IR literature has left infrastructures out of the equation, or treated them as a residual aspect.

¹ The importance of technological infrastructures springs also from export data and the involvement of Chinese firms in the worldwide expansion of infrastructures. For instance, the cumulative contract value of overseas railway construction projects in 2014 tripled the previous year and was at 24.7 billion US dollars (People’s Daily 2015). In dam construction, Chinese companies have globally, and particularly in Southeast Asia, by far the largest share.

Chinese efforts to pursue a global position have also attracted more research in recent years. Authors have employed different classical approaches such as realism or constructivism to evaluate the interaction of China and other countries, as well as the impact of the “China factor” on regional systems (Shambaugh 2004, Breslin 2006, Xuefeng et al. 2011). It is also indicated that China’s influence on the world stage is multi-dimensional, multi-perspectived, and fragile. A group of scholars favors a historical-cultural approach (Jacques 2011). According to this view, commonly shared normative assumptions and traditional values are the key to China’s assumed centrality within the region (Kang 2003).² Yet constructivist-inclined perspectives tend to categorically exclude material dimensions, such as regional power grids and infrastructures writ large. Ikenberry’s (2008) analysis of China’s integration in the liberal world order is typical as it eclipses the role of infrastructure. The conceptual frameworks so far applied to China’s regional posture do not tackle the questions raised by China’s infrastructural foreign policy. Specifically, the puzzle of how order is shaped and reshaped through infrastructures and vice versa is still under-conceptualized.

How might initiatives to build up large technical systems, connecting hubs, regions, and markets, translate into a hegemonic position for China? We study the particular case of China’s involvement in the Sub-Mekong area’s hydropower development, thereby narrowing down the scope of analysis, away from the global towards the regional level. Chinese engagement with foreign infrastructures has a long historical record in the Mekong region. It thus provides rich data on the complexities of infrastructure planning, construction, and maintenance (Greenough and Tsing 2003, Richardson 2009). So, while China’s involvement in hydropower exemplifies the role of large technical systems for the (potential) emergence of an alternative regional hegemon, we argue that it additionally offers insights into order-making on a global scale.

The rest of the paper is structured in three parts. First, we briefly review theoretical literature on the nexus of infrastructure and processes of order making. This analytical framework directs the research focus on three empirical sites that are explored in the fourth section: a) the phase of project development in which technical and political questions are intertwined in public controversies; b) how newly built hydropower facilities and the related water management shape power relationships via infrastructural monopolies; c) conflicting sociotechnical imaginaries about the governance of hydropower infrastructures related to the future of the region. The conclusion discusses the implications of China’s limited success.

Infrastructure, technology and the making of political order

Technologies and infrastructure have long attracted research attention from IR scholars. However, the discipline has only just begun to develop a greater sensibility to the diversity and dynamics related to infrastructures, technologies, and political order. The following draws links to

² Also many scholars within the inner-Chinese IR debates see Confucianism in conjunction with the historical memories of a China-centered tribute system helping to legitimize China’s role as future hegemonic power.

bodies of literature that are especially relevant to contextualize the study of Chinese involvement in hydropower development along the Mekong.

Infrastructure and concepts of hegemony

Approaches to international political economy stress global structures to articulate a theoretical understanding of order. Scholars like Susan Strange (1988) and Joseph Nye (2004) do not focus on specific infrastructural projects and installations. Their research, instead, recognizes how certain global arenas for trade, energy, and information, etc. are structured and restructured in order to gauge power shifts and hegemonic decline. Nye states, for example, how much the US dominance in information technologies and the respective infrastructural platforms underpins US political and security dominance in general (Nye 2004). More recently, the US national security strategy began labeling infrastructures, including information infrastructures as “critical” for national defense. In a networked world, vulnerability – to use Keohane and Nye’s (2001) concept – is no longer confined to commercial transactions. It entails the vital material systems themselves underwriting digitalization, as well as the interactive connection of buildings, energy supply, and industrial production (Lewis 2006, Collier and Lakoff 2008). In this sense, one can assume with Nye that regional infrastructures and the dependencies they imply are directly linked to the emergence of a (new) hegemon.

Realist or geopolitical analysis of power capacities as well as the analysis of empires, hegemonic wars, and deep changes in the international system share the notion that the position of great powers is intimately connected to infrastructures (see e.g., Buzan and Little 2015).³ John Ikenberry’s work on the “liberal empire” refers to the hub-and-spoke system as a main pillar of the US dominance in the Asia Pacific region. Besides formal alliances, military installations, islands, and large bases form the core of this security architecture (Ikenberry 2005, Harris 2014). Consider, for instance, the importance of the Suez Canal and the Panama Canal, at times, as transportation hubs for the hegemonic power projection of Great Britain and the US, respectively. The tumultuous history of these infrastructures clearly shows how much imperial designs are based on material underpinnings, lending credibility to the assumed links between order and large technical systems, such as artificial canals, roads, and railways. Infrastructures are crucial both for the rise of modern statehood and for power projection (Mann 2008).

Realist studies, however, are limited by their instrumentalist view of technology. This is evident from authors who focus on military technology in relation to regional power shifts. Their analysis concentrates on the shifting power capacities among China and the countries of the region and beyond. The core question is whether China replaces the US, respective (regional) responses and ramifications (Goldstein 2007, Ross 2006). These approaches assess the “changing of guard” by looking at classical indicators (like trade, investments, GDP, military power etc.) or systemic

³ The mainstream of hegemony theories, arguably, has not changed as to not paying serious attention to technology and infrastructures (see Ikenberry and Kupchan 1990, Hurrell 2006).

mechanisms such as balancing or hedging (Bert 2003, Percival 2007, Medeiros 2005, Cheng-Chwee 2008). However, even though the vocabulary also refers to the hub-spoke-system – quite tangible material facilities – realist frameworks have difficulties to theorize the interplay of regional and global order on the one side, and infrastructure development on the other.

Infrastructures are more than simple tools for power projection. For instance, anthropological and historical research underscores the underestimated vastness, local embeddedness, and often-violent impacts of US “imperial” installations in the Asia Pacific (Oldenziel 2011, Shigematsu and Camacho 2010). Michael Adas demonstrates the indispensable role of technological planning, construction, and networking for US power in the 20th century when it comes to waging war and nation building abroad. Yet, he also studies the failures and unruly qualities of infrastructures (Adas 2009). Similarly, John Krige (2006) shows how the US has employed scientific collaboration and research infrastructures to cement an alliance with Europe and reinforce the European countries’ defense and industrial capabilities during the Cold War – something only achieved through multiple controversies and mutual adoption of norms and understandings.

In sum, IR approaches offer ways to link technology and power. While the US-centered world order is not conceivable without US-dominated infrastructures, the assumption springs from the above discussion that new infrastructural connections (that might be more China-centered) might pose a challenge to this order. To better find a conceptual framework to explain how infrastructures and the remaking of order precisely are linked, we turn to another family of theories.

Technopolitics and co-production of order

Recent conceptual discussions under the header of “technopolitics,” instead, combine insights from both IR and science and technology studies. Thinking about technical systems thereby inspires a rethinking of traditional puzzles and grand questions in IR (see Mayer and Acuto 2015; Mayer et al. 2014). The idea of “co-production” suggests an understanding of order and order-making that is more comprehensive. “Order” is assumed as constantly reproduced at the material level, as well as at the institutional and cognitive levels. In fact, these levels can neither be easily separated through theoretical approaches, nor in empirical studies, as they belong to the totality of one construction process. The notion of co-production of order that we use here follows insights from STS (Jasanoff 2004). It assumes that technical, cultural, and political features of order get articulated and reshaped at the same time.

STS does not repeat Marxist dialectics. Going beyond the dichotomies of approaches such as Gramsci’s concept of hegemony (Gill 1993) or discourse theories (Laclau and Mouffe 2001), STS authors view political and natural orders as essentially co-constituted. Consequently, they suggest significant changes in the assumptions most fundamental to traditional social theories, most notably the abandoning of the strict epistemological distinction between social and material features of reality (Shapin et al. 1985, Latour 2000, Law 2004). This corresponds with work in IR, which studies the reconstruction of security, power, governance or identity through infrastructures and

technologies. Typically, these approaches focus on processes of emergence rather than interaction of fixed actors (Aradau 2010, Barry 2013, Schouten 2013).

Sheila Jasanoff (2004) has elevated the notion of symmetry that is central to STS to a new systematic level. Jasanoff emphasizes the simultaneous emergence of ontological and epistemological elements of social order that is particularly relevant for IR perspectives on world order. The theoretical considerations of Jasanoff's work lend strong credibility to the foregrounding of processes of "emergence." Transnational order or hegemony is not only always contingent, but also always "emergent." As a consequence, infrastructure is conceptualized as part of a highly interactive field between culture, science, and politics where regional order emerges, rather than getting imposed by allegedly powerful actors using technological means.⁴ The next section, then, suggests a tripartite analytical framework to study whether and how China's "infrastructural foreign policy" leads to a reconstruction of sociotechnical order.

Hydropower development and regional order

The process of order making comprises of an intertwining of technical and social aspects, physical dimensions and ideational forces – all emerging at the same time. Hydropower infrastructures have a region-wide and cross-boundary character. Our theoretical lens, then, directs the focuses at three sites at which order is co-produced to investigate the potential emergence of China's influence in reshaping the Greater Mekong Sub-region.

The first site refers to controversies about infrastructure planning and construction. Large-scale technical systems almost by definition involve techno-science and its expertise for planning and policy decisions (Jasanoff 2004). Authoritative knowledge tends to be highly contested and may remain so for a long time. Based on numerous empirical studies, the notion of controversies assumes that only if a closure is reached – naturally, by mixing objective and value questions – an agenda is fixed, respective policy clarified, and infrastructure projects thereby realized (Lynch and Cole 2005, Whatmore 2009). In turn, the prolonged existence of controversies over infrastructure construction is an indicator for the lack of hegemony of a single actor in a given policy field.⁵ Hydropower in the GMS is no exception. Key issues that structure public concerns most visibly are related to China's involvement in dam building, electricity distribution, and water regulation.

The second site consists of infrastructural dependencies that influence behavior, interests and, strategies. Scholars of large technical systems point out that these are characterized by a strong path-dependency. The logic of the "technological momentum" (see Mayer and Acuto 2015) also

⁴ Hence, while we do not completely deny the relevance of some of the realist and constructivist arguments outlined above, our own line of arguments follows a somewhat different path: If China tries to achieve hegemony in the South East Asian region, it likely does so neither by simply applying (its overwhelming) power resources, nor by any other form of coercive power to force country B to do what it had not done otherwise.

⁵ Peter Haas and others in IR (Adler and Haas 1992) use a different vocabulary, but reach similar conclusions. However, they focus on the closure of controversies that enables the powerful actors in the international system to set the political agenda.

applies to dams and their adjacent system – despite the social, cultural, and political diversity within the region.⁶ This notion can be combined with the idea of (inter)dependence advanced by Keohane and Nye (2001). Hydropower development involves several channels of infrastructural dependencies: a) funding for construction, b) market control in energy production and trade; c) institutions that control information exchanged between upstream and downstream parties; and d) the ability to produce authoritative knowledge related to dams, regional electricity networks, and impact assessments. Far from implying a deterministic view on the impact of material structures, we focus on the bargaining practices with respect to these three aspects that provide a sufficiently clear picture of the relative structural power of actors (see Strange 1988).

The third site which we will zoom in on is “sociotechnical imaginaries.” Especially in a region that is so highly subjected to outside interference and global connections, imaginaries are key to understanding the reshaping of order (see Appadurai 1990). The study of large technological systems is enabled by Jasanoff’s definition of sociotechnical imaginaries as “collectively held, institutionally stabilized, and publicly performed visions of desirable futures, animated by shared understandings of forms of social life and social order attainable through, and supportive of, advances in science and technology.” Furthermore, sociotechnical imaginaries “are not limited to nation states [...] but can be articulated and propagated by other organized groups, such as corporations, social movements, and professional societies” (Jasanoff 2015, 4). The planning, function, and maintenance of infrastructures is deeply involved with value judgments and strategic visions of the regional future. Often, various competing imaginaries are at work (Jasanoff and Kim 2009), and we assume that the prevailing imaginary also represents the order of a region. Conflicting imaginaries about the following themes became a crucial part of hydropower development in the GMS: a) state sovereignty and river regulation; b) the impacts as relative to the importance of energy, environment, fisheries etc.; and c) the number of stakeholders, namely, the evolving debate about who belongs to the region and who has a right to govern as part of collective arrangements.

GMS hydropower and regional order under construction

Exploring controversial knowledge, infrastructural dependency, and competing imaginaries offers an answer to the questions of how order is reconstructed in the region, and which position “China” currently occupies. This analysis does, however, not offer a state-centric view of Southeast

⁶ The GMS occupies approximately 2,6 million square kilometers (km²) and has a population of around 326 million (ADB 2013). This area is recognized not only as a physical region, but also as a cultural hub containing six countries (China, Myanmar, Lao PDR, Thailand, Cambodia, and Vietnam). They share geographical features, but cultures and traditional customs are only partly similar due to their livelihood along the Lancang/Mekong River (Dorsch 2006, 224). Development in the GMS poses a significant challenge in balancing needs and interests of different countries and populations, not only ones inside the region but also the outsiders. Sharing the Lancang/Mekong River with the total length of 800,000 km², the six countries possess have not only different locations and development levels, but have also complex political tensions and a difficult historical legacy. Hydropower development cuts right through the middle of the enormous cultural, ecological, and political diversity of region.

Asia. Rather, it tries to open up the black box of the GMS landscape in which nature, culture, technology, and politics are intertwined.

Hydropower Controversies

As “development projects,” hydropower construction in the Mekong river provides a great contribution to developing economies and poverty alleviation of countries in the region. Table 1 and 2 detail the number and magnitude of dams and electricity production along the Mekong and its tributaries. While only China has built dams blocking the main river flow, the vast majority of existing and planned dams, large and small, are located in the other countries; both at the main river and its tributaries. Dams are themselves large-scale infrastructures, but they also involve electricity grids, road and transportations networks, and monitoring systems.

However, the acceleration of regional cooperation, especially in the hydropower field, will negatively impact the environment and thus hurt the downstream states both environmentally and economically. Several plans for dams in China and a few countries along Lower Mekong have created significant challenges for the river, as well as the natural resources and human livelihood in the basin. Struggles over the management of water-issues between upstream and downstream needs and demands complicate any easy narrative of progress. Hydropower development in the Mekong River, in short, is often seen as a typical “collective action” problem, in which environmental impacts of the change of water flow become intra-national.

However, since the year 2000, transboundary impacts of hydropower development became a politically charged topic in the public discourses of all GMS countries (Molle et al. 2009). In some cases, the responses to the alleged Chinese influence on environmental issues turned fierce. Protests arose particularly against constructing hydropower dams. In 2011, the Myanmar

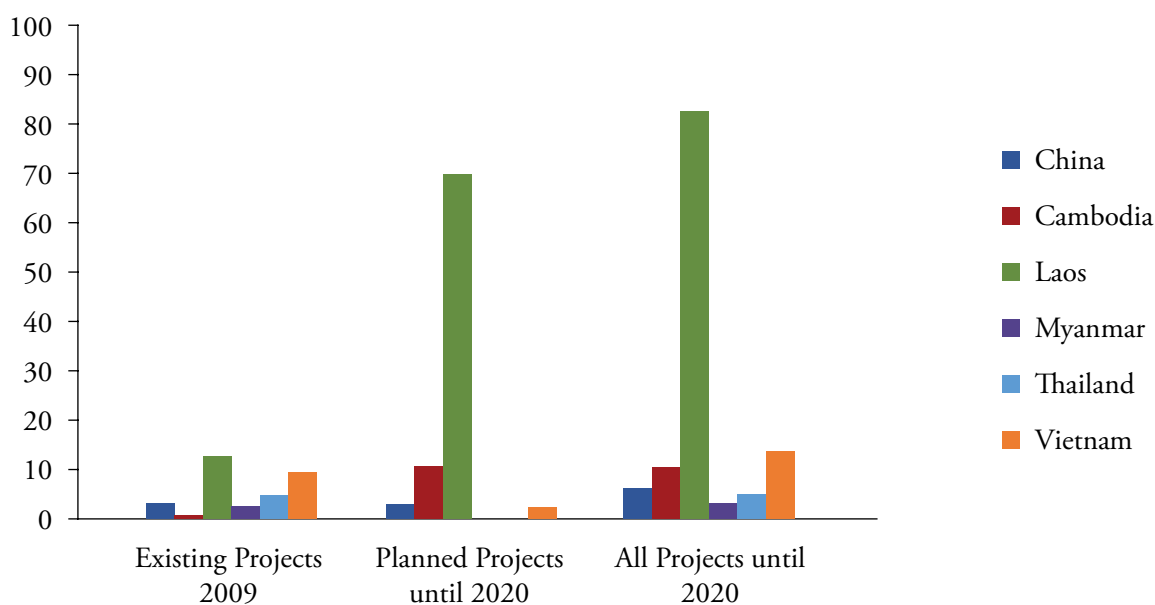
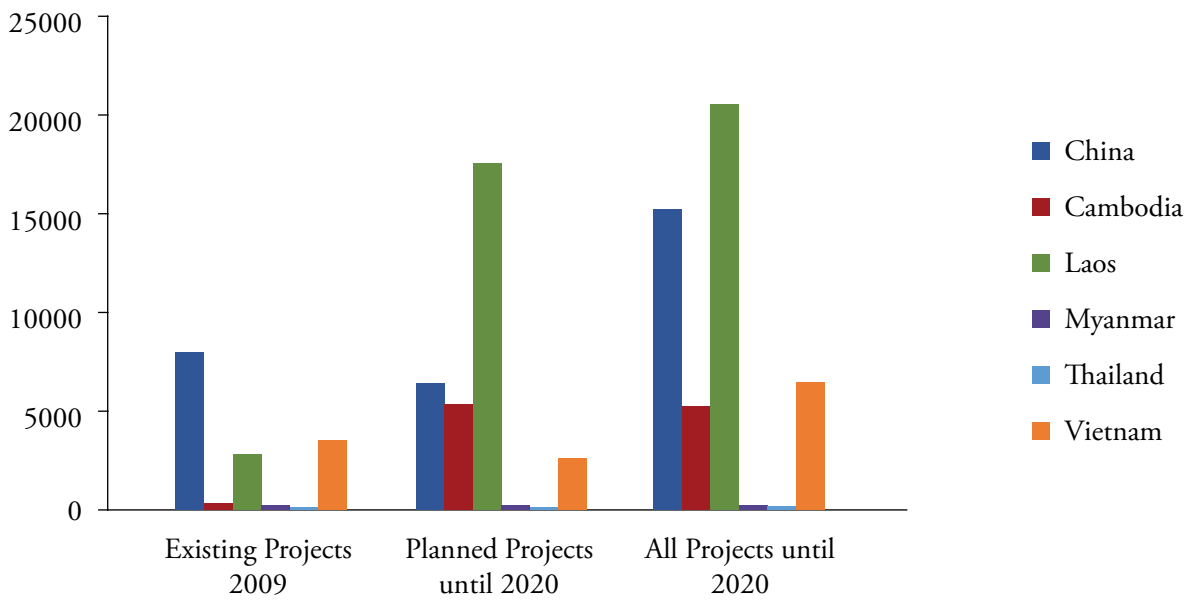


Table 1: Overview of hydropower projects



Sources: visualization based on data from Kuenzer et al. 2013, 573

Table 2: Expected Installed Capacity (in MW)

government stopped any further construction of the Chinese-funded 3.6 billion USD Myitsone hydropower dam on the Irrawaddy River. Besides the military conflict between the Burmese central government and the Kachin state, environmental concerns, community protests and distrust about Chinese impact assessments were mentioned as main reasons (Yu 2013). Even the environmental impact assessment of the state-owned China Power Investment Corporation (CPI), which wanted to build the dam, suggested halting construction (Linn 2013), while the project has not been resumed until today.

The unsettled controversy over Impact Assessments (IA) shows the underlying issues most vividly. Impact assessments were suggested as a solution for managing the Mekong River before officially starting the dam construction; for instance, the impact of hydropower development on the water flow and sediment availability, river-ecology, and biodiversity. Ideally, IAs should provide figures aiming towards regularizing the dam construction projects to serve domestic development needs. Yet, from the beginning, the question of whether there is a viable assessment has stirred up debates among the parties involved. The process of knowledge construction is ongoing, but no consensus about how to measure and weight positive and negative impacts of hydropower development has been reached (Käkönen and Hirsch 2009). The Vietnamese Ministry of Natural Resources and Environment acknowledges a serious lack of “an adequate scientific understanding for informed decision making on Mekong projects; especially with respect to downstream effects of upstream dams” which complicated any such attempts (Ministry of Natural Resources and Environment MONRE, cited in Kuenzer et al. 2013, 566).

Each party of this multi-stakeholder setting holds diverging interests and different impact assessment methods. The Mekong River Commission’s (MRC) approach to doing IA tends to limit indecisive issues, while emphasizing the controllability of the impacts, with the aim of

highlighting its own role as a coordinator. The Asian Development Bank (ADB) prioritizes economic interests, and supports hydroelectric development projects in the countries involved. ADB ignores its own energy and environmental policies in order to push forward funding for hydroelectric projects, often despite the lack of a finalized IA (International Rivers 2014). The countries Cambodia, Thailand, and Vietnam in the upper flow are concerned about the adverse impacts and call for the implementation of a more viable and powerful IA. Vietnam even suggests postponing the dam construction projects for 10 years in order to have enough time for correct assessment. Thailand, with its strong development of civil society, takes the approach that IA should focus on involving citizens, emphasizing the impact of dam construction on the people.

The final report on “Strategic environment assessment of hydroelectricity in the Mekong main flow” of the Mekong River Commission (of which China is not an official member) has not brought the parties closer. They remain deeply divided over scientific assessment (Mekong River Commission 2010). The Vietnam and Thailand groups maintain that their countries have received the most severe impacts relative to other benefits from the development projects along the main flow. In contrast, Laos states that it has received the least adverse impact. Specifically, Vietnam concluded that 67% of the estimated implications will lead to adverse impacts, while for Thailand it is 52%; Laos gives top priority to benefits in energy; reversely, Vietnam and Thailand give the lowest priority (Mekong River Commission 2010). China, which benefits greatly from dam construction projects, is rarely target of adverse impacts. The Chinese government gives primacy to economic interests brought about by hydroelectricity, rather than mentioning the adverse impacts on the river and on the countries in the lower flow (Goh 2004).

The existing scientific assessments, mostly officially commissioned, also became increasingly contested by independent researches and NGOs. The latter addressed the complex impacts of tributary dams and considered official studies as one-sided or selective. Independent, - typically qualitative, - studies have stressed the negative impacts based on evidence found in many completed projects where local communities have been directly and indirectly affected (Lu et al. 2008, Kuenzer et al. 2009, Rasanen et al. 2012).

In sum, hydropower development is hampered by the diverging normative positions that are mirrored in “scientific disagreement.” There is no closure of the debate about the impact of dams. The absence of accepted authoritative knowledge, in turn, reduces the chance of reaching any political consensus to realize the planned dams. Distrust and the lack of transparency is also fueled by the absence of an effective regional governance institution, which could provide an objective impact assessment of upstream Chinese dams on downstream water levels – an issue the next section will raise again. Clearly, the persistent controversies over hydropower infrastructure do not indicate Chinese dominance, leadership, or even hegemony. In addition, while ample disagreement exists between the South East Asian countries, authoritative knowledge about the impacts of dams stemming from Chinese sources is even more contested.

Infrastructural Dependencies

Dam building is a costly undertaking. The Chinese government assesses waterpower as a key element of its national development strategy for Western China, and has already built several large dams.⁷ Lao, PDR and Myanmar, two other upstream states, also have strong interest in developing river-dependent economies. However, due to their low development level (Myanmar was politically isolated for a long time and Lao PDR is among the poorest countries in South East Asian), they lack domestic technical capabilities and financial resources to implement large scale development projects. They are fully dependent on cooperation with China or Thailand to build their hydropower. In fact, out of the eleven dams built along the middle stream of the Mekong River,⁸ most dams were financed and built by Chinese companies. While Thailand is the most important investors in developing Lao PDR's hydropower potential, China has taken a "near-monopoly position" in developing Cambodia's water potential (Peipei 2012, 101). In Myanmar, China plays a major role in financial and technical support to help the Burmese government building hydropower plants as the government and private corporations aim for developing the hydropower potential of the Mekong to its fullest potential. Inevitably, this leads to the acceptance of a strong dependency on China for all practical matters.

China utilized the Mekong River to promote hydropower, seeking not only to provide electricity for the Yunnan Province and the eastern provinces of China, but also to export electricity and hydropower facilities to the SEA countries. Most of the GMS countries are developing economies in which exploiting water resources, specifically for producing electricity, plays a crucial role in guaranteeing a high economic growth rate and modernization. Concretely, the construction of infrastructures helped to form a "hidden hierarchy." The structural roles were manifested in the hydropower projects within the relationship of seller and buyer. These contracts are one-way in nature, which means one side shall be more vulnerable to the action or non-action of another. This also means that the dependence of one party on the other party – particularly on China in this case – would increase.⁹ Through electricity cooperation with China, Vietnam also benefits in developing energy infrastructure. In 2006, China Southern Power Grid Company (CGS) associated with the Electricity of Vietnam (EVN) to develop a hydropower station in Lao Cai at the total value of US\$28 million (Middleton 2008). However, as the case of the rejected offer by Chinese

⁷ The upstream region occupies half length of the Lancang-Mekong River, receives water from melting ice of the Tibet plateau shaping waterfalls with huge slope, some are 600 meters high. Along this area, China has built eight dams, four of which came to operation: Manwan Dam (126m high, finished in 1993); Dachaoshan Dam (118m, 2003); Jinghong Dam (107m, 2007) and the greatest one Xiaowan Dam (292m) which started to take water from the Mekong River into the reservoir 250km long.

⁸ Since 2006, seven dams in Lao PDR, two at the border area of Lao PDR and Thailand, and two in Cambodia were built, creating a series of 30-40 meter high dams.

⁹ For instance, in 2006, the Chinese company Sinohydro gained a Memorandum of Understanding with Myanmar to build a dam (called Gyi) of 1,200 MW along the Thai border. In April 2007, an energy company of Holding Group and China Gold Water Resources Company signed with the Burmese military government a project of additional 2,400MW taken from the Salween River. In April 2008, three companies, namely Sinohydro, China Southern Power Grid Co. and China Three Gorges Project Co. agreed a framework of cooperation to develop the hydropower potential of the Salween River (International Rivers 2008).

companies to build Vietnam's first nuclear power plant makes clear, the fear of technological dependence is strong, and the Vietnamese government aims to resist infrastructural hegemony.

The energy sectors of Mekong countries became intimately interconnected with China. Since 2004, Vietnam has increasingly imported electricity from the two Chinese provinces of Yunnan and Guangxi. In early 2013, the EVN requested the Vietnamese electricity companies to buy electricity from China as much as possible to ensure the security of the domestic electricity consumption, which is expected to reach 380mio kWh/ day (Tuoitre 09.05.2013). Lao PDR and Cambodia are in dire need of hydropower development for their modernizing industries. The two countries have received millions of USD in aid from China to build dams.¹⁰

Asymmetric relations are evident from information sharing and consultation between upstream and downstream countries. Chinese agencies responsible for river management are not bound to particular institutions or management regimes (except for the Agreement on the hydrological data exchange). In 1995, China refused to sign the "Agreement on the Cooperation for Sustainable Development of the Mekong River Basin." The agreement that was the basis of the Mekong River Commission (MRC) includes the four riparian countries of Cambodia, Lao PDR, Thailand, and Vietnam. At various occasions, the MRC countries tried to persuade China to join this group.¹¹ China refused to become a member of the MRC, and remains, together with Myanmar, merely a dialogue partner of this group. Although the MRC has other institutional weaknesses, the absence of the two upstream countries massively weakens this international regime, making the regulation of the use of water resources more difficult (see Kuenzer 2013, Grumbine et al. 2012).

The assertion of China's "unilateralism" in the region refers to the country's objection to the United Nations on the Law of the Non-Navigational Use of International Watercourses in 1997. While it is unclear whether Chinese hydropower plans for the Mekong River were the major reason for this decision, the sharing of information and consultation with the GMS countries is still selective and without any legal multinational mechanism. There is, argues Bearden, a lack of "specific legal principles and mechanisms regulating development on tributaries thus allowing parties to circumvent legal requirements for cooperative transboundary governance of the Lower Mekong tributaries, which is the reason for the wide proliferation of projects" (Bearden 2010, 790).

The problem of lacking authoritative knowledge, as discussed in the previous section, is strongly related to epistemic dependencies. China's capacities to produce engineering expertise related to hydropower development additionally increases the asymmetric interdependencies in the region. Drawing on its enormous experience in dam building, and having a flexing construction industry that operates worldwide, Chinese actors occupy a predominant position when it comes to knowledge about every aspect of planning, constructing, and operating large dams (McDonald et al. 2009,

¹⁰ In particular, the Kamchay Dam (193 MW) in Kampot province (Cambodia) was built by the Sinohydro Corporation in 2007, the Stung Atai project (120 MW) was built by China Yunnan Corporation for International Techno-Economic Cooperation (Middleton 2008).

¹¹ Since 2002, there have been some predictions about the prospects of Chinese participation. In the Joint Committee meeting and the following Dialogue meeting in 2004, it was announced by the chairman of the Joint Committee and State Secretary under the Thai Ministry for Environment that it would be "highly possible for China to join us" (cited in Menniken 2007, 109). However, so far China has still not become a member of the MRC.

Hung 2008). Consequently, other actors along the Mekong critically depend on data, engineering skills and scientific assessments delivered by their northern neighbor.

This is particularly relevant for IAs. Unresolved controversies about hydropower illustrate who provides objective knowledge in support of planning and decision-making matters. China's non-cooperative stance in terms of information sharing between upstream and downstream-states rendered a trust-based solution impossible. Nonetheless, the overall Chinese role could be seen as a "giver of last resort" of information, facts and expertise regarding the management of hydropower planning for the Mekong river.¹²

To counterbalance the knowledge gap, regional states have undertaken efforts to improve their epistemic capacities. US-led initiatives such as the Low Mekong Initiative (LMI) can be seen as an attempt to rebalance the regional knowledge dependence. Also, the US has pursued diverging policies in the Mekong region. Instead of focusing on state-sponsored mega-projects, LMI offers "projects involving the innovative technologies of Intel, the educational excellence of the Harvard Kennedy School, and advice on impact assessments and standards from the U.S. Mississippi River Commission and U.S. Geological Survey" (Bower and Parameswaran 2012). As key part of the massively expanded program LMI 2015, an action-oriented group was created in Myanmar, focusing mainly on "environment and water." Its goal is to help increase the knowledge and research capacities for the less developed ASEAN countries of Cambodia, Laos, and Vietnam. The establishment of the DRAGON Institute is another example. DRAGON is a cooperation between the governments of the US and Vietnam, aiming to develop a prominent research center on ecosystems and the sustainability of major river deltas in a changing climate.¹³

So, while riparian states benefit from China's dominance with respect to finance, engineering, construction, and energy markets, DRAGON and similar initiatives indicate that they are less inclined to accept Chinese *de facto* dominance in scientific knowledge production. Yet, for some time water management and hydropower development in the region will be epistemologically dependent on Chinese expertise and research.

Conflicting Sociotechnical imaginaries

Hydropower infrastructures are, as all large-scale technical systems, produced and expressive of sociotechnical imaginaries. They can turn into sites of the collective rearticulation of underlying values, visions, and hopes of peoples and governments of an entire region (see Jasanoff and Kim 2009). Thus, automatically, key questions of political order are weaved through sociotechnical imaginaries of hydropower: a) Infrastructure management embodies norms for the interaction of sovereign states; b) Infrastructure development is a key to negotiate conflicting values and

¹² Interview with Vietnamese scholars and officials in 2011, 2012.

¹³ See <http://dragon.ctu.edu.vn/eng/index.php/introduction/functions-tasks>.

priorities related to water resources; c) Infrastructure governance destabilizes the group of actors legitimately involved with regional governance.

Concerning the interplay of hydropower and national sovereignty questions, the principle of “absolute territorial sovereignty” (known as the Harmon Doctrine) is a good starting point. Upstream countries often cite it in order to highlight the inviolability of the right to use their national water resources. This enables the countries to use the water in any way they like within their boundaries “[a] state may demand the continuance of a river’s flow from the territory of an upstream riparian, but at the same time may make no change in the river that would affect its flow to a downstream riparian. This principle will presumably exclude all destructive water uses except in the territory of the last and lowermost riparian” (Tsering, n.d.). This doctrine also stood behind arguments of the Chinese delegation in the 1997 negotiations of the Convention on Law of Non-Navigable-Uses of International Watercourses.

China, ultimately, voted against the draft convention. The principle of “territorial sovereignty” did override the concerns with the ecosystem of a large river, which in principle belongs to all the riparian states.¹⁴ Regarding Chinese views on the entire Mekong River, “neither the government nor scholars have so far shown significant detailed engagement with broader ecological concerns, with agriculture, fisheries and other livelihood issues downstream.” The main problem, concludes Evelyn Goh, is that “Chinese discussions of the implications of their hydropower plans do not take a basin-wide view, concentrating only on the impacts within Chinese territory, when it is the downstream riparians who will suffer most disproportionately the ill effects of China’s plans” (Goh 2004, 11).

Some GMS countries follow the principle “limited territorial sovereignty.” It is based on the assertion that “every state is free to use shared rivers flowing through its territory as long as such utilization does not prejudice the rights and interests of the co-riparians” (Rahaman 2009, 160). This is often coupled with the principle of “equitable and reasonable utilization” of the water resources, which is “grounded in the doctrine of limited territorial sovereignty” (Ibrahim 1998). Those principles can be understood as “a basin state’s sovereign rights to the waters of international rivers within or adjoining its territory are limited by the corresponding sovereign rights of other basin riparians. A state may thus utilize the water to the extent that this use does not interfere with the reasonable utilization of other basin states” (Ibrahim 1998). Based on the idea of shared sovereignty and equality of rights, the principles aim to create “a balance of interests that accommodates the needs and uses of each riparian state” (Rahaman 2009, 161) and a joint responsibility with the community of member states which should be placed as a priority of behaviors.

¹⁴ The official representative of the Chinese delegation, Gao Feng, gave two reasons to explain his objection: “First, it failed to reflect general agreement among all countries, and a number of states had major reservations regarding its main provisions. Secondly, the text did not reflect the principle of the territorial sovereignty of a watercourse State. Such a state had indisputable sovereignty over a watercourse, which flowed through its territory. There was also an imbalance between the rights and obligations of the upstream and downstream States” (Press Release GA/9248).

In spite of China's dominant role in infrastructure development (section 4.2), its GMS neighbor countries imagine different principles of "territorial integrity" for using Mekong's water. Vietnamese officials state that Mekong is an international river, not a private property of any country. The exploitation of the river needs to consider concerns about interests of countries in the region, environmental impacts and influences on species and people living in and along the river, ensuring balance between economic development, social security, and environmental issues¹⁵. Besides imaginaries of how "sovereignty" and technologies ought to be reconciled, the vision of a "prosperous and peaceful Mekong region" presents a controversial point.

In terms of building hydropower plants and the associated environmental impacts, one can observe a normative divergence between China and the GMS countries. There are several ways in which hydropower infrastructure is linked to different collective visions of the public good. The Chinese perspective on developing dams has received ambiguous responses from GMS countries. Specifically, there are conflicting collective visions of hydropower development in the region and the relative importance of different priorities. On the one hand, some countries have raised their voices opposing the "dam inflation" in the Mekong River initially caused by China.¹⁶ While some GMS countries have accepted China as a main partner in supporting them to construct dams (Lao PDR and Cambodia) and others are big importers of electricity from China (Thailand and Vietnam), the three downstream states of Thailand, Cambodia and Vietnam have pursued diverse benefits in development of the GMS. The Thai government also desires to export electricity, which is expected to be produced by additional hydropower plants, and to foster regional integration and create new markets.

On the other hand, critical voices emphasize the trade-off between hydropower and environmental issues faced by all countries along the Mekong River. Solving the environmental issues and aiming at a more sustainable future may require sacrificing short-term economic benefits by controlling the hydropower boom. This naturally goes against the assumptions ingrained in Chinese knowledge production and the Chinese government's political outlook, namely the priority of electricity generation and economic development generally preferred by the Chinese side (Linn 2013, Yu 2013).

As governments have welcomed Japanese and US actors to help them solve environmental issues and potentially create a "power balance" with China (Nabers 2008), competing sociotechnical imaginaries evolved. Which collective vision is prevailing, then, becomes linked to the question of which actors are legitimate parts of the Mekong region. For instance, in a visit to SEA of the US Secretary of State Hillary Clinton in July 2009, the Lower Mekong Initiative was launched. It brings together Thailand, Lao PDR, Cambodia and Vietnam in "water security issues" and aims to facilitate multilateral cooperation in the ongoing projects of water management. While China

¹⁵ For instance, an expert from the Institute for Foreign Policy and Strategic Studies, Diplomatic Academy of Vietnam supposes that in order to solve the current challenges of the Mekong River, "the nations of the Mekong must be willing to allow for the sufficient erosion of national sovereignty to enable a truly trans-border solution to emerge that will ultimately benefit all" (Le 2013).

¹⁶ Interview with Vietnamese and Laos scholars and officials in 2011, 2012 and 2013.

was excluded, the foreign ministers of Thailand, Lao PDR, Cambodia, and Vietnam welcomed the tight cooperation of the US with the downstream countries in various fields in order to ensure regional sustainable development (Press Release of the US-Lower Mekong Ministerial Meeting). The US Department of State also expressed its concern about “the negative impacts of the dams on the regional food security” in which fish provide one of the major food sources for local residents (Bureau of Public Affairs 2009).¹⁷

How the “identity” of the Mekong region, the interests of external actors, and the use of hydropower are interrelated again became apparent two months later, when Japan held the first Mekong-Japan Summit in November 2009 with the attendance of prime ministers of the four lower riparian countries. Although the agenda touched upon many issues – including Japan’s strong support for the construction of power lines near the Mekong River and Delta in the CLV countries – the cooperation around water resource management and around addressing climate change were the most highlighted (Ministry of Foreign Affairs Japan 2009).

Four years later, the fourth Mekong-Japan Summit in 2013 defined three new pillars in cooperation of “Strategic partnership aiming to a common prosperous future” between Mekong countries and Japan during 2013-2015. The agenda stressed the enhancing connections within the Mekong region and between Mekong countries with outside countries based on developing intra-national transport corridor, including a joint information and telecommunication infrastructure and modernizing customs. Moreover, the summit also aimed to enhance cooperation in the environmental field, human security, climate change, and managing water resources of the Mekong (Ministry of Foreign Affairs Japan 2013). The implicit focus was clearly on making Japan more integrated in the region than before.

Imaginarities play an important role in forming “a common GMS” since they convey a shared understanding, expectation, and knowledge between different actors within and across societies. China’s main competitors in fostering a regional order are the US and Japan. With the establishment of the AIIB, the competition for intellectual and financial leadership has intensified (Borroz and Marston 2015). It is manifested, for instance, in the struggle between an “inclusive development” idea, considering many aspects of human needs including trans-boundary water resources management, infectious diseases, and vulnerability to climate change and “extractive growth,” focusing on fostering economic dynamic with the involvement of the GMS countries in order to create a regional economy with hydropower at its center. Hydropower, hence, becomes entangled in competing imaginaries and linked to different reframings of regional identity. In this open-ended process, regional states are not just buying “into the hegemon’s vision of international order and accept it as their own” (Ikenberry and Kupchan 1990, 284). Hydropower infrastructures, in turn, remain unstable sites inspiring and connecting the ordering efforts of numerous actors.

¹⁷ Following Clinton’s visit, a workshop on energy development in the GMS was organized by the US Embassy in Cambodia, in which issues on building dams in the context of climate change and its negative impacts on the environment were discussed critically (US Embassy in Cambodia 2014).

Conclusion: Unfulfilled dreams of China's infrastructural foreign policy

China's investments, technology transfer, and construction efforts over the past 10 years have created a web of cross-border linkages, technical networks, and economic dependencies. Despite political tensions, China's promotion of hydropower has contributed greatly to ensure the region's energy supply. The country is forming the center of a sort of technological "hub-and-spoke" system in the GMS's electricity field, and thus, seemingly remaking regional order.

Yet, despite the fact that most countries are heavily reliant on China concerning dam construction, energy markets and expertise, strong controversies over impact assessments exist. In addition, diverging sociotechnical imaginaries about the future of the region indicate that it is far too early to talk about a China-centered regional order. The process of finding principles and agreeing on certain value judgments guiding the use of Mekong's water resources remains open-ended. This involves not simply fixed (national) "interests" or conflicting preferences. Rather there are competing visions about the meaning of "common prosperity" and "inclusive development." Hydropower infrastructures became contested in relation to the complexity of human needs and "extractive growth," focused primarily on energy supply. These diverging visions crosscut societies, political actors, elites, populations, and interest groups.

To the detriment of the Chinese government, the struggle about the future of hydropower development also entails the question of which external actors, such as Japan and the USA, should be included in its governance and which forms of governance should be adopted. The persistence of differing standpoints and coalitions around these issues means that the regional order is under reconstruction. From the view of sociotechnical imaginaries, Chinese attempts to gain a leading role in the regional politics have faced great difficulties. For all these reasons, a Chinese hegemony in Southeast Asia remains a distant prospect. This study, in other words, also provides insights into the Chinese resource-outcome gap that has been discussed for some time. The focus on controversial knowledge and sociotechnical imaginaries shows that the nexus between infrastructure and political order remains contingent.

Finally, hydropower in the GMS offers food for thought about whether and how China's recent infrastructure initiatives may lead to changes in the country's overall position and, relatedly, global order. Conceptually, it suggests how Beijing's infrastructural foreign policy can be related to the interplay between infrastructure construction and competing projects for global ordering. A key result is that the establishment of large material networks, such as the "Silk Road Economic Belt" and the "21st Century Maritime Silk Road," may not easily translate into a China-centered order. Even if infrastructures result in strong economic dependencies, as in the case of the hydropower development at the Mekong, we can assume that long-standing controversies arise from planning and constructing these technical systems.

Beijing's current outlook is far-reaching, - especially compared to the earlier rather limited goals of its foreign policy. The Silk Road initiatives in particular, and Beijing's foreign policy ambitions in general, embody President Xi's slogan of the dream "for the great renewal of the

Chinese nation.” However, knowledge controversies and conflicting sociotechnical imaginaries are inevitably part of the realization of these bold plans – or what some see as hegemonic ambitions. In other words, a new regional order does not simply emerge through creating “connectivity partnerships” between China and its neighboring countries. Without shared imaginaries, as well as the reliance on authoritative knowledge, billions paid for infrastructure projects might just produce unfulfilled dreams.

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