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## Immaterial Infrastructures and Conflict in the Salween River Basin

**Stew Motta**

IVM, Vrije Universiteit Amsterdam, Amsterdam, the Netherlands; s.e.a.motta@vu.nl

**Aaron T. Wolf**

College of Earth, Ocean, and Atmospheric Sciences, Oregon State University, Corvallis, OR, USA;  
wolfa@geo.oregonstate.edu

**E. Lisa F. Schipper**

Geography Department, University of Bonn, Bonn, Germany; lschipper@uni-bonn.de

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**ABSTRACT:** This paper historicises Burmese and Thai efforts to cooperate around hydraulic infrastructure construction in the conflictual Salween landscape. Transboundary water governance literature focuses on the material or physical changes in river flows or in upstream and downstream governance dynamics that are caused by infrastructure. This study enhances understandings of water conflict and cooperation by tracing how immaterial infrastructure can increase conflict dynamics at potential Salween project sites even before any concrete has been poured. Hydraulic infrastructure is used in its immaterial forms to restructure the landscape and international relations. The Burmese military or 'Sit Tat' uses such projects as an 'illiberal signal' to convey future political intentions to international partners. The immaterial infrastructures hold together securitised elite alliances that obtain legitimacy and foreign reserves for the Sit Tat in exchange for future resource extraction profits. Mirumachi's TWINS model (Transboundary Water Interaction Nexus) is used to highlight moments of infrastructure intentions that simultaneously increase violence and conflict without changes to the river's hydrology. This paper shows how international cooperation around megaprojects keeps Salween communities in cycles of violence and dispossession for decades, even at project sites where infrastructure has yet to be constructed.

**KEYWORDS:** Hydropolitics, immaterial infrastructure, conflict, environmental justice, Myanmar, Thailand

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### INTRODUCTION

This paper takes a critical hydropolitics approach to the analysis of conflict and cooperation dynamics around the Salween River that runs between Myanmar and Thailand. While China is viewed as the classic hegemon in the Mekong region in general and in Myanmar's domestic context in particular, Chinese state-owned enterprises (SOEs) waded into contested hydraulic infrastructure plans relatively recently. From the 1950s it was Japan, rather than China, that played the larger technical and financial role in both Myanmar and Thailand (Akimoto, 2004; Hirsch, 2016). The attention that has more recently been given to China has obscured decades-old efforts by elite Thai and Burmese actors to cooperate around river basin development and resource extraction in the Salween River. This paper foregrounds that historical hydropolitical relationship, which remains very active into the present. In the paper, the timeline of shifts in cooperation and conflict is visualised through Mirumachi's Transboundary Water Interaction Nexus (TWINS) matrix (Mirumachi and Allan, 2007).

The Burmese military – also known as the 'Tatmadaw' – will be referred to here as the 'Sit Tat', which removes the honorific royal aspects of the name (Aung Kaung Myat, 2022; Dunford, 2023). The generic title of Sit Tat was bestowed upon the military by the Myanmar public after the violent and illegal seizure

of power in 2021 (Desmond, 2022). Although the Sit Tat has changed its name over time, 'Sit Tat' will be used throughout the article in reference to their role in various historical periods; this maintains consistency for the reader and avoids glorifying the group. The Sit Tat has once again shattered its borders and is resuming reliance on its key and highly securitised relationship with neighbouring Thailand. Coup leader Min Aung Hlaing's first diplomatic communique was to the Thai military; in 2018, in recognition of his close and supportive relationship with the Thai military, he was awarded the Knight Grand Cross of the Most Exalted Order of the White Elephant (Macan-Markar, 2021). For his first official trip as commander and chief, and even as Myanmar was descending into violent post-coup chaos, Min Aung Hlaing visited the Salween basin. There, he extolled the benefits of the proposed large-scale hydropower projects on the Salween River, which were designed to generate electricity for export to Thailand (Lin Htet Myat, 2021).

Figure 1. Map of the proposed hydropower dams and water diversion schemes on the lower Salween River.



Source: International Rivers (2020).

The Salween River forms the border between Myanmar and Thailand. Its river basin has been a primary geographical locus for their cooperation, which has been forged through joint infrastructure and extractive business ventures. These hydraulic infrastructure projects are not yet constructed. They are being pursued, however, in a river basin that has no formal treaties, no data sharing, and no agreements – a condition that has been proven to have direct links to increased hydropolitical tensions and conflict (Wolf et al., 2003; Petersen-Perlman et al., 2017; de Stefano et al., 2017). These projects include agreements for multibillion dollar hydraulic infrastructure plans that also entail large-scale auxiliary infrastructure such as roads, tunnels, extensions of transmission lines and grids, pumping stations, and the clearing of vast swaths of high-value forests.

Such project plans tend to proliferate, with one project expanding and justifying construction of another. Water diversion projects in Thailand have become entwined with Salween mainstream hydropower megaprojects that are planned in Myanmar as energy export deals, sending electricity over the border to the Thai grid (Deetes, 2022; Middleton et al., 2019). These unbuilt projects are in the planning stage; they lack physical form and are referred to as immaterial infrastructures. These immaterial infrastructures interact and, in the process, they rearrange large swaths of territory on both sides of the international border.

Understanding the evolution of these infrastructures and identifying patterns of interaction will be the focus of this article. To analyse these patterns of conflict and cooperation, this study applies Mirumachi and Allan's TWINS model (2007) to illuminate the evolution of Thai and Burmese relationships as they pursue cooperation in the form of hydraulic infrastructure development on the Salween River. This study is not able to present detailed coverage of the decades of shared histories; it does, however, provide an overview of the engagement.

The analysis shows patterns of increasing conflict and violence for Salween communities alongside state-to-state cooperation efforts; this occurs despite no actual concrete having been poured and no project completed. We show that conflict dynamics are affected by hydraulic infrastructure projects even in their immaterial or ideational forms. Cooperative agreements between national governments for the development of hydraulic infrastructure are shown to cause territorial disputes at multiple scales. Attempts to send surveyors to hydropower locations spurs armed clashes at project sites and forces refugees over the border. Low points in international relations and high levels of conflict in Myanmar are meanwhile followed by attempts to reinvigorate cooperation around hydraulic infrastructure deals in the Salween. During times of armed conflict and cross-border raids, international alliances are held together by speculation on lucrative future extractive deals. The unbuilt projects are used as communication tools, signalling the political intentions of the Sit Tat to its international partners. The projects are valuable to the Sit Tat's alliances abroad; at the same time, even in their unbuilt form they are useful for reordering contested territories in the Salween basin.

## SALWEEN HYDROPOLITICS

The Salween River basin is considered to be at 'high risk' for hydropolitical tensions (Wolf et al., 2003; Wolf and Newton, 2008; de Stefano et al., 2017). This high risk evaluation is supported by the lack of institutional capacity within the Salween community for addressing the rapid changes in the basin. There is no international data-sharing agreement, no grievance mechanisms, and no treaty around how the Salween should be managed. The systems that are in place do not ensure justice in water governance outcomes, and the existing unbalanced power relations can lead to coercive agreements (Zeitoun and Warner, 2006; Zeitoun et al., 2020). In the absence of such agreements in the Salween – particularly in Myanmar – much of the control over the resource has been determined by the 'way of the gun'. As this study illustrates, hydraulic infrastructure has become highly securitised and directly linked to military ambitions.

The basin supports a host of ethnic armed organisations (EAOs) that have nationalist ambitions and histories of highly conflicted relations with the Sit Tat and with each other (South, 2021; Yoffe et al., 2003). One way to conceptualise the conflict in Myanmar is that World War II never really ended (Thant Myint-U, 2019). WWII embroiled the country in conflict. Insurgencies and civil war were forged that continue until today, making it the longest-running conflict in the world (Smith, 1991). These tensions are extremely complex and violent due to the Sit Tat and the presence of dozens of armed groups; the latter include EAOs, border guard forces, and militias active in the region (Buchanan, 2016, 2017).

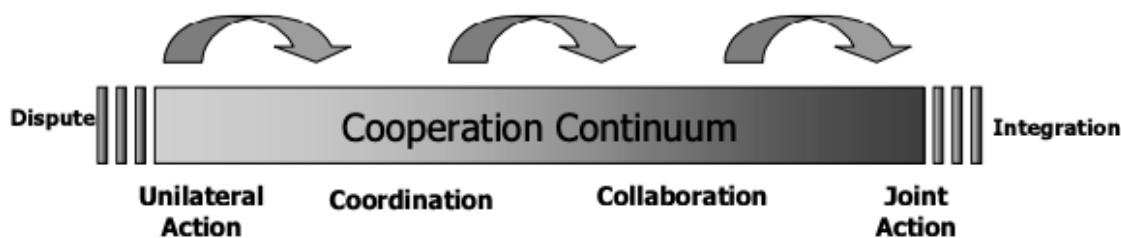
These groups have a wide array of goals which sometimes overlap and sometimes are at odds. Some groups are allied with the militaries of Myanmar and Thailand and some are currently at war with these states and with one another. The ongoing conflict between the Sit Tat and Burma's EAOs is the longest and most complex in the world (Mathieson, 2018). This conflict has resulted in the displacement of over half a million people, many of whom are displaced multiple times in the course of their lives (South, 2007; Simpson et al., 2018).

This war-torn landscape is not under the centralised control of a single nation-state. Central governments in both Myanmar and Thailand seek to profit from extractive infrastructure ventures while at the same time rendering peripheral contested territories 'legible' and in line with central government agendas (Scott, 1998). The Sit Tat and its 'crony companies' are joint developers of the mainstream hydropower dams in Myanmar, with the crony companies serving as a fundraising arm of the regime. In this light, contestations over infrastructure development are not only about territorial disputes; they are also about the legitimacy and financing of the nation-state itself (Allouche, 2020). This finding is accentuated in the territorially contested Salween where these dynamics have led researchers to conceive of the Salween as a 'fractured commons' (Suhardiman and Middleton, 2020). It is in this fractured and contentious landscape that Myanmar and Thailand pursue hydraulic megaprojects in the form of hydropower and inter-basin water diversion projects.

### Contested cooperation

Cooperation around joint infrastructure projects is thought of as a diplomatic goal; degrees of cooperation are conceived of as being on a continuum towards positivist joint action around dam construction (Figure 2).

Figure 2. Cooperation continuum.



Source: Sadoff and Grey (2005).

Sadoff and Grey's concept of riverine cooperation is a popular conceptual framework and is reproduced in regional development strategies. It is promoted by the World Bank (WB), where both authors have been employed. The development of hydraulic infrastructure that is being promoted aligns neatly with the finance and project services that the Bank aims to provide (Molle, 2009).

In Central, South, and Southeast Asia, the WB and the Asian Development Bank (ADB) promote cooperation through joint infrastructure construction and regional integration of energy systems

(Deguchi et al., 2020; Tortajada and Saklani, 2018; Bakker, 1999). In the Mekong region, the ADB's Greater Mekong Subregion (GMS) Economic Cooperation Program is the most prominent regional strategy (Bakker, 1999; Middleton et al., 2012; Matthews and Geheb, 2014). The ADB has claimed that investing in hydropower schemes in contested territories would bring a peace dividend (Hirsch, 2016). The WB is an active investor in the GMS strategy and has laid the groundwork for many of the plans. This included forcing the privatisation of Thailand's energy system as part of loan stipulations in the 1980s (Johns, 2015). This in turn led to the creation of the Energy Generation Authority of Thailand (EGAT), which is intended to act as the hub for the regional energy grid (Middleton et al., 2012). In Myanmar, the ADB supported the preparation of the 2015 Myanmar Energy Master Plan (BEWG, 2017).

Calls for cooperation through infrastructure development on shared river systems ignore the well-established links between development and conflict (Selby, 2014). All large hydraulic infrastructure involves conflicts between social groups and knowledge regimes (Boelens et al., 2019). Infrastructure construction on a shared river is inherently political and the politics is as important as the technical considerations (Molle, 2009). 'Win-win' claims elide the political realities of hydraulic infrastructure development in transboundary rivers where, "all water management is multi-objective and is therefore, by definition, based on conflicting interests" (Priscoli and Wolf, 2009: 4).

Salween diversions and mainstream dam infrastructures have been promoted for decades, but none have been built. By 1989, Thai, Burmese and Japanese actors had set up joint committees for hydraulic infrastructure construction and were pursuing international projects (Wolf and Newton, 2008). The international momentum for cooperation on damming and diverting the Salween often follows periods of high conflict and civil unrest. The 1989 push for joint infrastructure construction occurred less than a year after the '8888 uprising' (referring to 8 August 1988). This was one of Burma's most infamous nationwide democratic movements, which the Sit Tat cracked down on in September killing thousands of citizens and sending thousands of political activists into exile in the Salween border area (Milbrandt, 2012).

These ruptures in the system offer opportunities for capital expansion and rapid territorialisation on Myanmar's frontiers (Rhoads, 2020). The abrupt political change was accompanied by a shift to a market-based economy; this was accomplished primarily through trade with Thailand, which was searching for new resource frontiers (Lang, 2002). Thai timber companies closely linked to Thailand's central government received lucrative timber concessions in the Salween River basin; this constituted a financial infusion for the Sit Tat (with timber accounting for an estimated 42% of exports) and helped support their military incursions into ethnic areas (*ibid*). These projects, and the actors who are working on this continuum of cooperation, are highly securitised. The Myanmar crony-led International Group of Entrepreneurs (IGE) has close familial ties with the Sit Tat leadership; it is the second-largest timber corporation in the country and is also a joint developer of three of the proposed Salween dams (Human Rights Council, 2019; Middleton et al., 2019).

### **Conflictual infrastructure**

In transboundary river dynamics, hydraulic infrastructure development has been shown to have one of the strongest links to conflict (de Stefano et al., 2010; de Stefano et al., 2017). This is particularly the case in river basins where there are hostilities or a lack of institutional capacity (Wolf et al., 2003). Despite these conflictual realities, 'win-win' development and elusive shared benefits 'beyond the river' is a mantra of hydropower proponents and is frequently used as a tagline for rendering highly contested infrastructure in the Mekong region in a positive light (Zhong et al., 2016).

In the academic literature, most of the links between hydraulic infrastructure and conflict have focused on material changes brought by infrastructure projects, typically through upstream and downstream relations and changes in water flows. Conflict over international rivers in the Mekong region is not about the river itself, but rather about the land and the contested territory that is associated with

the basin (Hirsch, 2016). Hydraulic infrastructures have been used for territorial conquest through both material ways such as diverting water for agricultural expansion and as symbols of national triumph and modernity (Swyngedouw, 2007; Allouche, 2019). The Salween River has never been controlled by the Sit Tat and it is home to the regime's adversaries; incentives for territorial conquest and military triumph are thus elevated.

The mainstream dams can be conceived of as part of a strategy of territorial conquest, as a component of Sit Tat business expansion, and as a form of violent infrastructure (Rodgers and O'Neill, 2012; Sims, 2021). In the very complex fabric of Myanmar's decades-long civil wars, it is difficult to draw arguments of causation between infrastructure and armed conflict; the country's natural resource governance and its armed conflict are, however, "inextricably linked" (Woods, 2019). All of the proposed Salween mainstream dam sites and the associated infrastructure are in disputed and conflict zones.

Even when not situated in war zones, dams are often sites of violence. A systematic global review of 220 dam conflicts found that "repression, criminalization, violent targeting of activists, and assassinations are recurrent features"; in at least 20 cases, murders had occurred (Del Bene et al., 2018: 631). The rate of violence was also observed to increase dramatically when Indigenous communities were involved (*ibid*); this is relevant here, as Indigenous communities are the primary peoples living at the proposed Salween mainstream dam sites, which raises the risk of direct violence.

In addition to this direct violence, hydropower dams in the Mekong region have been found to also produce 'slow violence' (Nixon, 2011; Blake and Barney, 2018; Baird, 2021; Sims, 2021). Riverine communities that have not been directly displaced from a reservoir can experience the slow violence of diminishing benefits over subsequent years due to declines in ecosystem health and functions (Blake and Barney, 2018). Communities displaced by material dams, or in the case of the Salween communities through immaterial projects, experience disruption of their livelihoods; over time they become trapped in cycles of poverty (Manorom, 2018). Slow violence from the proposed Salween infrastructure is already occurring near project sites through restriction of access, however the risk is also high for the more densely populated areas downstream of the dams. Myanmar's Salween River basin is home to around six million people and the delta is the most densely populated area of the entire basin (Johnston et al., 2017).

These immaterial infrastructure projects – without even being built – exclude access, sideline alternatives, and wreak violence on the most vulnerable populations. This study explores the question of how immaterial infrastructure impacts conflict and cooperation dynamics in transboundary water governance. To answer this question, the article employs the TWINS model. The model illustrates that long before physical changes are brought about by development in the Salween River basin, conflict and cooperation dynamics are already being affected by plans or imagined futures around potential hydraulic infrastructure.

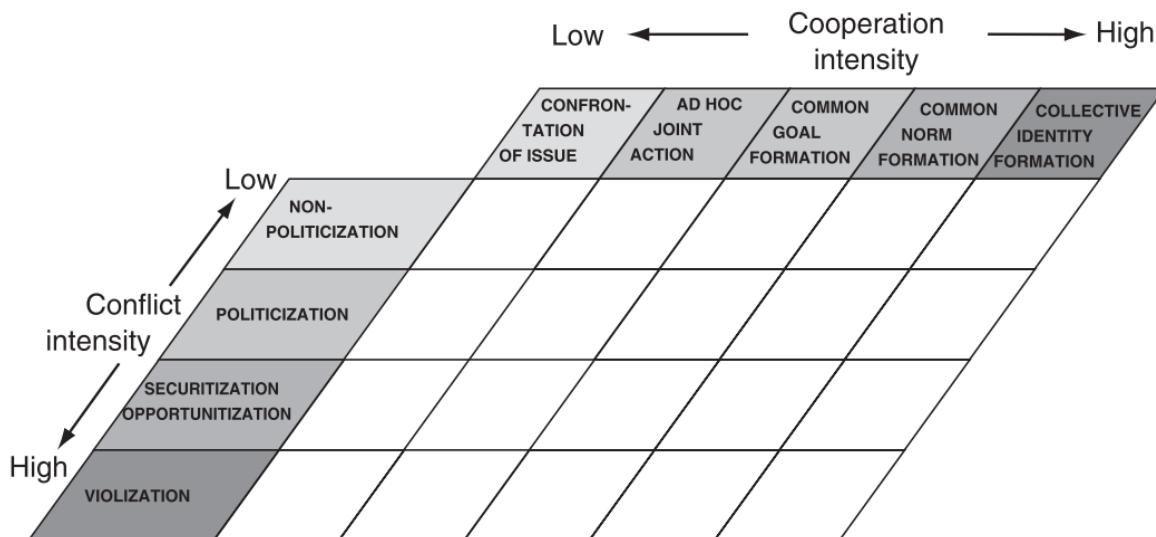
## METHODOLOGY

The TWINS model is unique in that it enables transboundary power dynamics to be traced over time and allows for the coexistence of conflict and cooperation (Mirumachi, 2015). The coexistence of cooperation and conflict is crucial for analysis of the Salween landscape, where official cooperation or 'speech acts' between central governments and militaries is experienced by other actors at different scales as being conflictual and violent. Similarly, domestic political upheaval and conflict in Myanmar is followed closely by increased cooperation with Thailand. The TWINS model operates on two axes of cooperation (x5) and conflict (x4) and builds on Craig's (1993) 2x2 grid of high and low levels of cooperation and conflict.

The TWINS model has been applied to a number of rivers, including the La Plata (Kirkegaard, 2016), the Mekong (Mirumachi, 2015; Grünwald et al., 2020), the Ganges, Nile and Orange (Mirumachi and Allan, 2007; Mirumachi, 2015), the Scheldt (Warner and van Buuren, 2009), and the Zambezi (Fatch and Swatuk, 2018). It has also been used to address conditions in the Bangladesh delta (Mutahara et al., 2019)

and urban water governance in Milan (Vitale and Meijerink, 2021). This study is the first application of the TWINS matrix to the Salween River.

Figure 3. TWINS matrix.



Source: Mirumachi and Allan (2007).

The results section illustrates where the relationship is on the TWINS grid in the form of a (cooperation numeral: conflict numeral) format. A (3: 2) rating indicates 'common goal formation' for cooperation and 'politicisation' for conflict. 'Collective identity formation' (5: x) is the most intensive form of cooperation and is never achieved. 'Violisation', or acute violence, (x: 4) on the other hand, is the highest form of conflict and it occurs multiple times in the Salween River analysis.

This article acknowledges that most literature on the Salween has been produced primarily by non-state actors, namely civil society organisations (CSOs) (Middleton and Lamb, 2019). In a highly conflictual and opaque decision-making arena, grey literature from CSOs was crucial in assembling the Salween hydropolitics timeline. It relied on reporting from the Burma Environmental Working Group (BEWG), Burma Rivers Network (BRN), Karen Environmental and Social Action Network (KESAN), Save the Salween Network (SSN), Shan Human Rights Foundation (SHRF), Shan Women's Action Network (SWAN), and Towards Ecological Recovery and Regional Alliances (TERRA).

The hypothesis that immaterial infrastructure has been impacting conflict dynamics over time was verified and supported by in-depth key informant interviews. Unbuilt infrastructure physically restricts access to resources and homelands while sidelining other visions of Salween futures. Fifteen Salween key informants were interviewed, with discussions usually lasting one to two hours. These interviews built on the first author's five years of work experience in Myanmar, where qualitative participant observation helped frame the research design. Interviews were conducted over the phone and internet, with and without video, and were conducted in English unless otherwise noted. Interviews were informal and mainly focused on perceptions of hydropolitical relations across actor groups in the Salween context.

To create the Salween timeline, the scope of research moves outside of the 'water box' to include media and events databases. The Online Burma Library (OBL) was used; it began compiling relevant data in 1987 and is currently the largest single online source of Burma documentation. The Human Rights Watch database was helpful in correlating hydropolitical speech acts to recorded episodes of violence and subsequent flows of refugees across the Salween River into Thailand. These databases were crucial

in establishing the timeline for the TWINS analysis. Documentation from development organisations active in this space were also helpful in tracking infrastructure interventions over time; these included the Japan International Cooperation Agency (JICA), WB, and ADB.

TWINS focuses on the process of water governance over shared rivers; it presents an historicised approach for the Salween rather than snapshots of conflictual or cooperative moments. Water conflict is often assessed at flashpoints, but this historic approach establishes the endurance over time of the hydrocracy (the top-down engineer-dominated group of elite actors that pursue hard infrastructure development), examining it in the light of decades of violence at project sites (Molle et al., 2009). As this study will illustrate, the Salween hydrocracy entails high levels of militarisation, in the form of Sit Tat influence on dam designs, crony corporation involvement in the projects, and the first Salween dam surveys funded by Japanese war reparations. Hydraulic infrastructure sites on the Salween River date back to the 1950s; they began with the construction of Myanmar's very first large-scale hydropower project on the Baluchaung, a tributary of the Salween.

The TWINS model creates a visualisation of that cooperation and conflict over transboundary water resources in the Salween basin; it extends from that first project in Myanmar to the present day. The study cannot present details of every change in the relationship; however, it begins by providing an overview table that tracks the changes in an abbreviated form. The numbers in the table correspond to points of change in Burmese-Thai relations on the TWINS matrix. Following the timeline offered in the table, a few key time periods will be highlighted and expanded on in greater detail.

## RESULTS

Table 1 provides a summary of the overall timeline of hydropolitical relations between Myanmar and Thailand in the Salween River basin from the 1950s to 2022. After the table, we expand further on 4 of the 12 defined stages of the relationship.

Table 1. Conflict and cooperation periods between Myanmar and Thailand.

Time period	Actions	Grid
1. Japan's reparation dams, 1950s to 1988	<i>Detailed below</i>	(1: 1)
2. Concessions for democracy, 1988 to 1990	Thai General Chavalit visited Burmese generals in December 1988, months after their brutal crackdown on the '8888' democratic movement. By April 1989, the energy ministries from both countries had established a joint committee to develop hydropower dams on the Salween River (Wolf and Newton, 2008; TERRA, 2006).  Myanmar holds the largest teak forests in Southeast Asia, as well as much of the remaining global supply (Deb et al., 2017). In 1989, after Thailand banned logging at home, the Thai military negotiated at least 20 advantageous logging concessions with the Sit Tat, many of which took place over the border in the Salween River basin (Buszynski, 1998; Lang, 2002). The timber deals were extremely advantageous to Thailand as the Sit Tat was desperate to access foreign capital (McCarthy, 2000).	(2: 2)
3. Battlefields to marketplaces, 1990/1991	In 1990, two years after Thai Prime Minister Chatichai Choonhaven called for the transformation of battlefields into marketplaces (Hirsch and Wilson, 2010) and less than two years	(3: 2)

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	after the 8888 uprising, another flashpoint occurred, as the National League for Democracy (NLD) won national elections in Myanmar with an overwhelming 80% of the votes (Tonkin, 2007). The Sit Tat refused to recognise the results and another wave of democratic leaders fled to EAO-controlled areas on the border and into exile in Thailand. General Chavalit and the Thai military attempted to broker negotiations between the NLD and the Sit Tat, but they were unsuccessful (Silverstein, 1992).	
4. Greater Mekong Subregion (GMS) energy integration and Japanese power development, 1992	Months after the members of the elected NLD government joined EAOs and student democratic groups in the Thai-Burma border areas, the hydropower coordinating committee convened in Bangkok and pledged to accelerate dam construction (Priscoli and Wolf, 2009). In March of 1992, Japan's Electronic Power Development Corporation (EPDC), which had been added to the committee, proposed eight hydropower projects on the Salween; that August, the Thai cabinet approved the Salween Diversion Scheme to extract water from the shared international basin and transfer it to the Chao Phraya (Wolf and Newton, 2008). This represents an increase in cooperation to 'common norm formation'.	(4: 2)
5. Global attention and the securitisation of hydropower, 1993	The Sit Tat doubled in size in just five years in terms of soldiers and arms alongside Thai investment and economic integration (Hyndman, 2002). Dams became clearly 'securitised' on the TWINS grid and came to be viewed as a tool of Sit Tat conquest by EAOs:  "The plan to construct dams in the Salween watershed regions, is not for development, but because SLORC (Sit Tat) wants to destroy the Karen revolution base, since it is our best area. If we move from our area, we and the Karen revolution, will naturally lose the fight, and our nation" (KNU Saw Steve (Burma Library, 1994)).	(4: 3)
6. Chaos and cross-border raids, 1994 to 1997	<i>Detailed below</i>	(2: 4)
7. Asian financial crisis, 1997 to 2000	Thailand's MDX Power Co.; Japan's EPDC, and Burmese officials began surveying the Tasang dam site (Salween Watch, 1999). These hydropower surveys were halted by the Shan State Army 727th Brigade, which at that point had increased power through military alignment with other Shan EAOs ( <i>ibid</i> ).	(2: 4)
8. Thaksin era, 2001 to 2006	Dam plans were reinvigorated during the period of Thai Prime Minister Thaksin's leadership and the Asian Development Bank's Greater Mekong Subregion energy strategy. In August of 2004, Burma and Thailand pushed their collaboration further, launching a joint venture to together construct five mainstream dams. The Energy Generation Authority of Thailand (EGAT) began sending teams to the basin to conduct surveys (Middleton et al., 2012; Wolf and Newton, 2008). Two EGAT staff were killed in a grenade attack at the Hatgyi dam site (also spelled Hutgyi) further downstream (Paritta, 2014). Despite this loss of life, in 2005 EGAT	(3: 4)

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	inked a memorandum of understanding with the Burmese energy authority to build Hatgyi. The Sit Tat subsequently launched attacks on Karen groups around the project site ( <i>ibid</i> ).	
9. Chinese state-owned enterprises in the post-Thaksin era and increases in scale, 2006 to 2012	<i>Detailed below</i>	(2: 4)
10. Myanmar's transition, 2012 to 2015	In 2012, the Sit Tat brokered a landmark ceasefire agreement and resumed the Hatgyi Dam project on the Salween River (Suhardiman et al., 2017). The dam developers pushed ahead despite the efforts of the National Human Rights Commission of Thailand and the many civil society organisations that lobbied and brought information to the Commission on the direct links between the dams and the conflict (Middleton and Lamb, 2019; Nang Shining, 2011). This was followed by increased militarisation, and in 2014 fighting again broke out near the Hatgyi Dam site (Paritta, 2014).	(2: 3)
11. Ceasefire capitalism, 2015 to 2019	Myanmar's Ministry of Electricity and Energy rejected the recommendations of the International Financial Corporation to place a moratorium on the Salween mainstream dams, and instead the Salween projects forged ahead with Sit Tat escorts taking Chinese engineering teams into the mainstream dam sites (Interview 1, 2020; Tan Hui Yee, 2018; SHRF, 2018; Lindsay, 2020).	(3: 4)
12. Securitised Salween River, 2019 to 2022	<i>Detailed below</i>	(1: 4)

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### Japan's reparation dams, 1950s to 1988 (1: 1); Stage 1

The history of Salween hydropower projects can be traced back to Japanese involvement in the 1950s. At that point, Burma and Thailand had yet to collaborate on the Salween, hence the low cooperation and low conflict rating of (1: 1). The TWINS grid does not incorporate Japan as a third actor, however the history is an important background and sets in motion many of the infrastructure arrangements that continue to be pursued. Mirumachi and Allan (2007) did discuss adding a 'political economy' axis to the TWINS matrix. In this case, the incorporation of international third party engagement or investment could be useful to illustrate the changing international assistance from Japan around the infrastructure projects.

Japanese business interests surveyed the Mekong region in the 1950s, searching for hydropower dam sites (Akimoto, 2004). This engineering-dominated top-down approach to controlling nature through infrastructure development is an example of a 'hydrocracy' carrying out the 'hydraulic mission' (Molle et al., 2009). Corporations such as Nippon Koei, which was founded by Kubota Yutaka, were able to leverage the Japanese government's funds post-WWII in order to construct hydropower generation plants in the name of war reparations (Moore, 2014). Kubota was known as the 'Shogun of the Mekong' for his influence on hydraulic infrastructure planning in the region; he and his colleagues, "missed the excitement of demonstrating their 'masculinity' in shaping 'virgin frontiers', which were increasingly scarce within the post-war borders of 'tiny Japan'" (Nagatsuka, 1966, in Moore, 2014). Rivers in the Mekong region are feminised, while the management of infrastructure – both in the 1950s and currently – is male-dominated (Lebel et al., 2019).

Nippon Koei and others were able to get Japanese official development assistance (ODA) to begin construction in 1954 of the Lawpita Hydropower Project (HPP) (IFC, 2017). Lawpita HPP, later known as Baluchaung II, was the country's first large-scale dam project; it was built in the Salween basin on the Baluchaung tributary (*ibid*). A theme that continues through this analysis is the residual and lasting nature of these infrastructures and the hydrocracy that supports them. Over 60 years later, Japan continues to fund repairs and refurbishments at Baluchaung II through ODA financing, with investments being made as recently as 2017 (Clark, 2003; Chan Mya Htwe, 2017).

From the beginning of hydropower development in the Salween basin, there was acute violence or 'violisation', including the Sit Tat's use of forced labour in the construction of dams on the Baluchaung (Akimoto, 2004). The area was not under Sit Tat control and the site was militarised, including the setting of swaths of landmines to protect the area from attack by EAOs that claimed the territory (*ibid*). Villagers were subjected to forced labour, loss of land, and armed conflict, all of which continued to surround the series of Baluchaung projects into the 1990s (ERI, 2001).

The 'violisation' associated with hydraulic infrastructure construction in the Salween River basin is a trend that continued on the Myanmar side of the Salween from the 1950s through to the 1990s. As international cooperation between Japan and Myanmar increased during those decades, people at the subnational level experienced extremely high levels of conflict around hydropower initiatives. This violisation from the outset of hydraulic infrastructure development is not captured by the TWINS model as the projects did not involve Thailand.

During this period (Stage 1), Japan also began actively pursuing water diversion schemes and dam projects in Thailand's Salween basin. Japan International Cooperation Agency (JICA) funded feasibility studies that identified multiple dam sites on the Yuam tributary of the Salween (Hengsuwan, 2019). These projects were of interest to the Thai state primarily because of their potential role in inter-basin water transfers. These transfers could remove up to 10% of the Salween's flow, channelling it out of the international basin and into Thailand's Chao Phraya basin (Wolf and Newton, 2008). This would increase the quantity of water at the Bhumipol dam, which is named after the late and revered Thai king who was known as the 'Father of Water Management' (Blake, 2015).

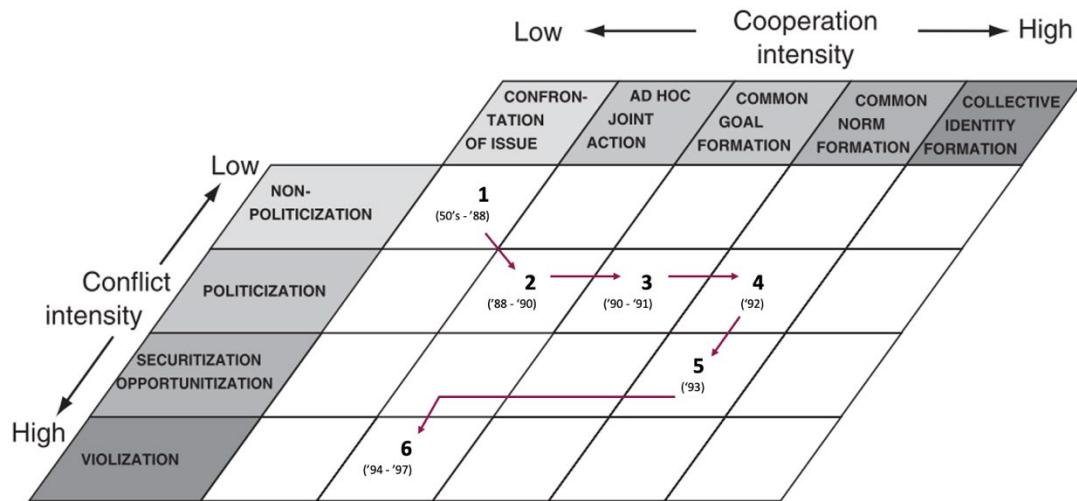
The diversion scheme was first announced by the Thai government in 1979 (Bright, 2019). It has re-emerged multiple times over the decades, finally receiving Environmental Social Impact Assessment (ESIA) approval in 2021. The enduring nature of this project plan illustrates that immaterial infrastructure can have a lifespan that is as long as that of a constructed project. These persistent development imaginaries and narratives are important as they have tangible geospatial and territorialisation implications (Hirsch, 2016; Geheb and Suhardiman, 2019).

### **Chaos and cross-border raids, 1994 to 1997 (2: 4); Stage 6**

The period of the mid-1990s is marked by increasing militarisation and violisation at the Salween dam sites in Myanmar (South, 2007). Instead of the traditional ideas of 'water wars' with two militaries going to war over water, this violisation often targets unarmed civilian populations. During this period, the Sit Tat can be observed carrying out violent forms of internal territorialisation (Vandergeest and Peluso, 1995). They are seen to be increasing their military presence at potential mainstream dam sites, moving in battalions, and forcibly relocating nearby communities (BRN, 2008).

In the early 1990s, the Sit Tat had dramatically increased the size and scale of its offensives in the eastern parts of the country (Hyndman, 2002). Commercial activities and investment in contested parts of Myanmar did not defuse, but rather perpetuated, conflict (Woods, 2011; Forsyth and Springate-Baginski, 2022). By that time, as depicted below, EAOs clearly conceived of the dams as direct forms of territorial conquest:

Figure 4. Stage 6.



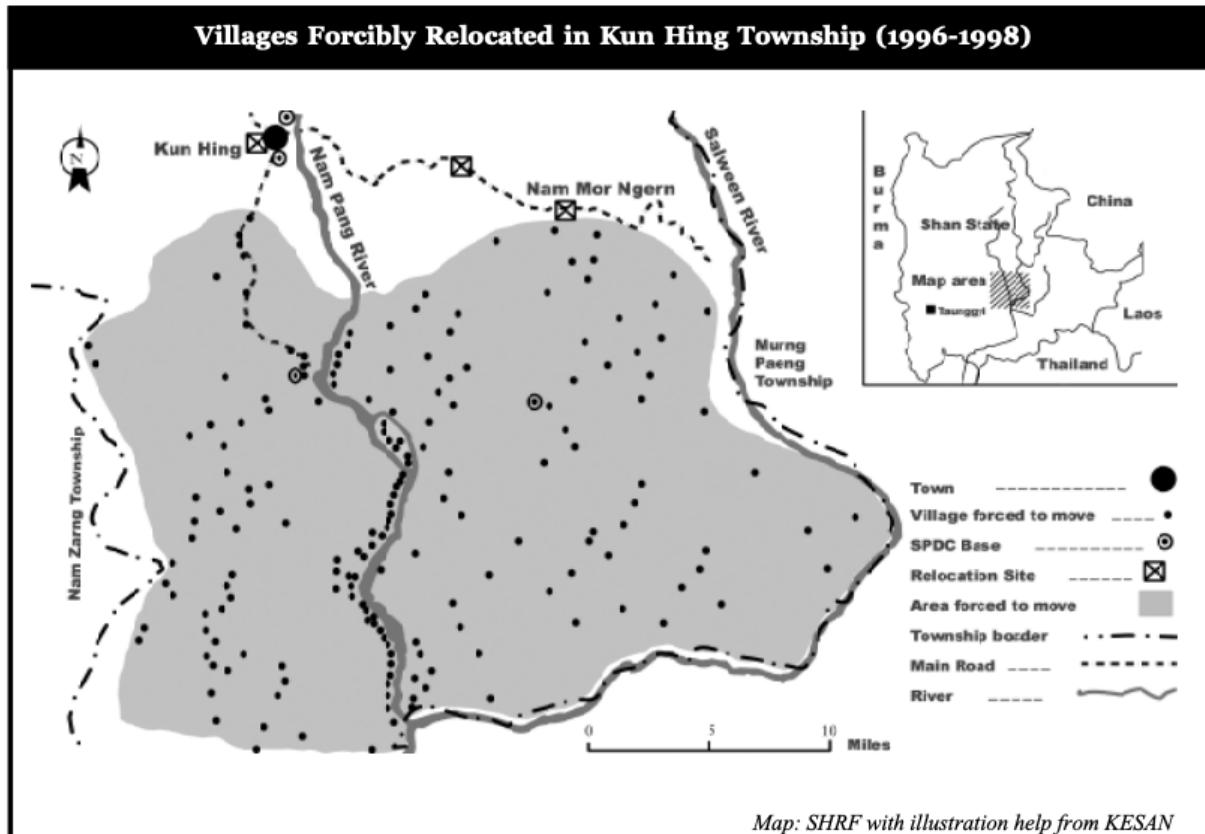
If the dam projects become reality, there are three ways for us to go. The first is to go to refugee camps in Thai territory. The second is to go to a SLORC (Sit Tat) concentration camp. And the third is to stay on the top of the mountain like animals. If the dam projects are fulfilled, SLORC (Sit Tat) will gain large sums of money which will be converted into weapons to kill us. The massacre of the indigenous people along the Salween watershed will inevitably happen (Padoe Kawsoe, Karen National Union Central Committee; Burma Library, 1994).

Such fears of conquest persist, such that past experiences of conflict limit the ability to conceive alternative futures; the communities of the Salween are thus temporally constrained and enclosed (Jaramillo and Carmona, 2022). Salween communities do not perceive these infrastructures on a cooperation continuum; rather, the projects recall recurrent forms of violence and dispossession (Wittekind, 2018). Over 60% of hydropower plants are situated in ethnic parts of the country (BEWG, 2017). The concerns raised above – about being forced to live "on the tops of mountains like animals" – have, if anything, increased. Since the 1990s, the projects have ballooned in size; if built, they would flood over 1,000km<sup>2</sup> of the resistance groups' homelands (IFC, 2017). The infrastructures have thus acted as forms of internal territorialisation in the past and continue to do so (Vandergeest and Peluso, 1995).

The relocations were often conducted without advanced warning; they were violent, involving forced labour, extrajudicial killings and sexual violence (Akimoto, 2004; BRN, 2008). The Tasang Dam was to be constructed first, and in Shan State over a thousand villages were relocated in just two years; this resulted in the violent displacement of nearly 60,000 families and around 300,000 people (Figure 5) (Akimoto, 2004). During this offensive, the Shan Women's Action Network and the Shan Human Rights Foundation documented 173 cases of rape involving 625 women, with a quarter of these ending in murder (SHRF and SWAN, 2002). Civilians were used as forced labour for the construction of infrastructure; they were also used as porters in battles, many forcibly seeing frontline combat where they died or were maimed from shelling or landmines (HRW, 1995).

This increase in conflict intensity saw tens of thousands of Salween residents flee to Thailand. These numbers from Shan State added to the Karen refugee flows. The Sit Tat assaulted the Karen National Union (KNU) headquarters in 1995, eventually taking the border stronghold (Brenner, 2018).

Figure 5. Tasang Dam forced village relocations.



Source: Shan Human Rights Foundation, with illustration help from Karen Environmental and Social Action Network (KESAN), as found in Akimoto (2004).

Not only did Thailand receive refugees, but armed groups from Myanmar began attacking refugee camps in Thai territory, engaging in cross-border raids during which they committed arson, kidnapping and murder (MARP, 2004). In April of 1995, over 100 troops crossed into Thailand and set fire to a Karen refugee camp; this caused over 3000 people to again flee violence, this time within Thai borders (*ibid*). By the end of 1995, Karen people alone constituted 70,000 of the refugees living in camps. Bangkok was under considerable pressure to move the camps further into the Thai interior as violent cross-border raids were commonplace (HRW, 1998). "Thai soil is being invaded almost daily by the Burmese Army, and the Thais feel they are powerless to do anything about it" (Shenon, 1995).

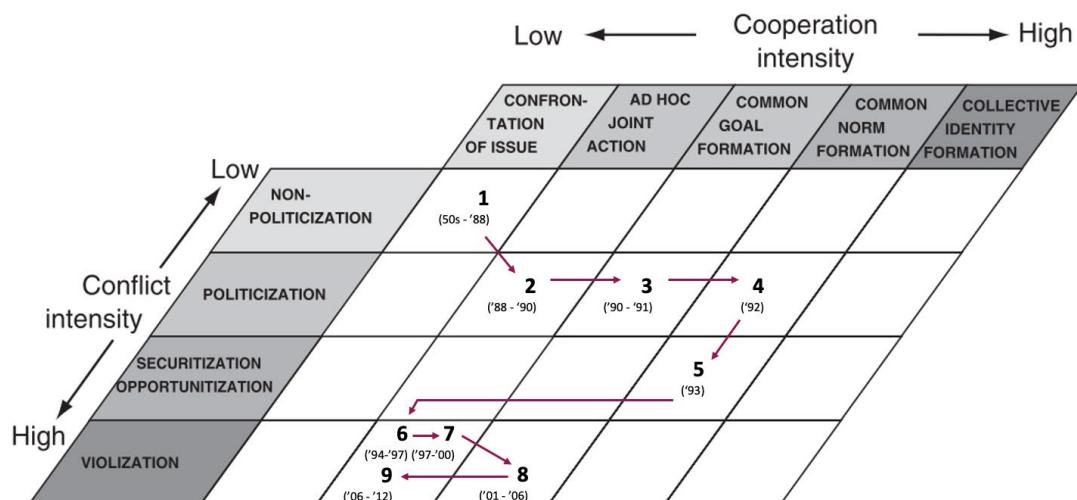
Thai citizens, police and soldiers were killed in the continued cross-border raids, and eventually Thailand launched helicopter gunship strikes on outposts inside Myanmar (*ibid*). One might assume that taking in over 100,000 refugees, consistently being invaded, and loss of life to those serving the country would cause Thailand alarm. During this time period, however, after a 1995 low point in Burmese-Thai relations, with only "ad hoc joint action" cooperation occurring alongside high levels of 'violisation', Thailand still worked to support Myanmar's accession to ASEAN, to which Myanmar was successfully admitted in 1997 (Cribb, 1998).

In 1997, the two countries signed a memorandum of understanding (MOU) for hydropower development, which was aimed at "the mutual benefits of the peoples of the Kingdom of Thailand and the Union of Myanmar"; EGAT agreed to purchase energy produced from the highly conflictual Tasang dam (*WRM Bulletin*, 2000; Wolf and Newton, 2008; Fonseca, 2003). Cooperative agreements for

infrastructure were pursued even during the most conflictual and violent period of the two countries' diplomatic relations. Immaterial dams are able to hold securitised alliances together against all diplomatic odds. To further strengthen trade ties and provide improved access to the resource-rich area, the Myanmar-Thailand friendship bridge was opened over the Salween's Moei tributary (Guyot, 1998). In spite of the cross-border chaos, international relations were maintained through the promise of potential future profits around the dam locations.

#### **Chinese state-owned enterprises in the post-Thaksin era and increases in scale, 2006 to 2012 (2: 4); Stage 9**

Figure 6. Stage 9.



Thai Prime Minister Thaksin was overthrown in a 2006 coup. Around this time Chinese state-owned enterprises (SOEs) emerged as part of the 'Going Out Policy' (*zuo chu qu zhan lüe* 走出去战略); they took on larger shares and greater responsibility for the Salween dams. Thailand's cooperative role diminished, especially around the construction of projects in the basin.

It has been suggested that the inclusion of Chinese SOEs is not politically driven and that those active in the Salween basin are acting only on private interests:

While it could be hypothesized that Chinese officials encouraged CTGC [China Three Gorges Corporation] and Sinohydro to take part in the projects to ensure a Chinese foothold in the country, with possible political benefits, no supporting evidence was found for this hypothesis. The electricity generated by the two projects is not an economic benefit to China (Kirchherr, 2018: 821).

The idea that Chinese SOEs were acting outside of political interests as part of 'standalone projects' overlooks the historical reality and the securitised nature of the infrastructure. It was political interests and the 2003 US sanctions placed on Myanmar that made financing the dam projects through international financial institutions (IFIs) such as the ADB and the WB (in which the US holds one of the largest shares) more difficult for Thailand (Seekins, 2005; Sims, 2020). These two IFIs did fund other dam projects as part of the GMS strategy in the Mekong region (notably in the Lao People's Democratic Republic), but could not give loans to Thailand for projects in Myanmar because of political sanctions (Shoemaker and Robichaud, 2018).

The same year that the sanctions were imposed, Myanmar's Sit Tat leader Senior General Thein Shwe travelled to Beijing on an official diplomatic trip to secure preferential loans for energy development

(Geng, 2007). In turn, the state-run China Exim Bank provided concessional loans for the Paung Laung dam, which at the time was the largest Chinese hydropower project in Southeast Asia and the largest dam project in Myanmar; it also gave a US\$200 million soft loan for the 790 megawatt (MW) Yeywa dam which, as of 2022, is the largest hydropower project in the country (*ibid*).

This government-to-government engagement ushered in rapid hydropower development in Myanmar. During this era, Chinese SOEs took a leading role in all the major projects under construction (Geng, 2007). Thailand's stake in the dams declined due to the increase in Chinese financing and the mounting influence of Chinese actors over the energy planning in Nay Pyi Taw (Urban et al., 2013).

Another noteworthy change during this time is the dramatic increase in the size of the proposed hydropower projects (Motta and Matthews, 2017). This massive increase in scale was proposed by the Sit Tat (not by the Chinese SOEs or their consultancies), even though the Sit Tat lacked hydraulic engineering expertise (IFC, 2017). Before even being built, these immaterial infrastructures expanded their influence over contested territories. The mainstream Hatgyi Dam grew from 300 MW to 1360 MW (Suhardiman and Middleton, 2020). The 3000 MW Tasang Dam, where construction attempts had already been marred by bloody conflict, was renamed the Mong Ton project and its planned capacity was more than doubled to 7110 MW; this hydropower project, if built, would be the largest in all of Southeast Asia (Wolf and Newton, 2008; Roberts, 2019).

With the proposed siting and size of the projects being determined by the Sit Tat, serious questions might be raised about the nature and identity of the forces driving construction of the dams. To put the scale of these dam plans into perspective, by 2009 the Burmese government's entire installed energy capacity was 1420 MW (IFC, 2017). A single proposed dam project on the Salween River would thus rival, or exceed, the entire country's installed energy capacity. The over 7000 MW Mong Ton design calls for a gigantic 380-kilometre-long reservoir with an estimated cost of over US\$6 billion dollars (*ibid*). This reservoir is expected to flood out, or at least directly impact up to 120,000 people in an area the Sit Tat has never fully controlled; this area is home to the support base for the Shan EAOs with whom they have been fighting for decades (Roberts, 2019).

The Mong Ton as an immaterial infrastructure exerts influence over vast areas of Shan State and the Sit Tat uses the dam plans as a pretext for military occupation (SSN, 2016). The project does not, however, entail only territorial conquest or timber extraction; this plan's presence on the national agenda also excludes all sorts of other plans or visions for the region. How would one approve development plans for roads, telecommunications, crops or markets for an area that is slated to be flooded? At a local level, this uncertainty impacts agricultural decision-making as well, as farmers are hesitant to plant trees or crops with longer-term harvest cycles (Interview 1, 2020). The immaterial Mong Ton affects community access to resources in the near term through militarisation of the area, and it also has longer-term effects in the form of what is not pursued due to the potential project.

Chinese engineers trying to reach the Mong Ton site in 2009 were apprehended by the Shan State Army. This suggests that control of the area remains in dispute despite all the aggressive military campaigns (Nang Shining, 2016). Kirchherr (2018) suggests that it is a boon to have the Chinese SOEs' expertise in hydropower construction in building 'standalone' projects of this scale. As shown through the historical analysis of these infrastructures, the dam projects are not standalone private endeavours; rather, they have evolved together with the Sit Tat's designations of size and their selection of locations in disputed conflict zones, which occurred long before Chinese SOE involvement. High levels of government-to-government diplomacy took place around the dams; it was not that SOEs behaved as 'contractual' or profit-seeking corporations as Kirchherr (2018) claims.

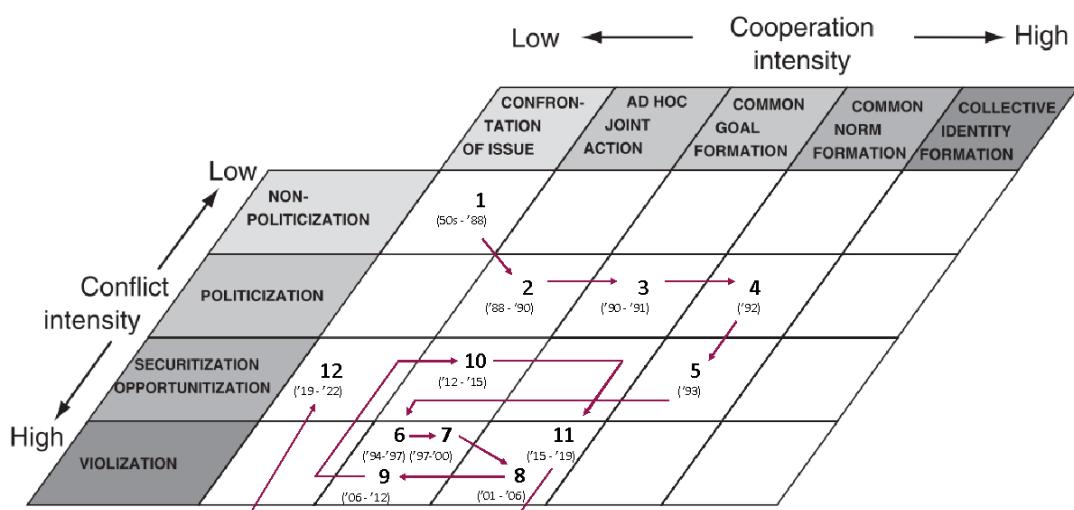
The Thai government also does not view the projects as simply corporate enterprises pursuing profits. EGAT, in its testimony before the Thai senate committee in 2006, described the dams as 'government-to-government' projects (Supara, 2006). Communities fled the Hatgyi Dam site after attacks by the Sit Tat, which was the same year the case was brought to the National Human Rights Commission of Thailand

(Suhardiman and Middleton, 2020). The following year, two EGAT staff were killed at Hatgyi Dam site, this time from a landmine (Vaddhanaphuti et al., 2019).

In 2010, the SOE China Datang attempted to survey the Salween mainstream Ywathit Dam site, which had ballooned from 600MW to 4000MW (BRN, 2010; Middleton and Lamb, 2019). A convoy of Burmese soldiers escorting Datang personnel were ambushed by Karen fighters in Karen State and three people were reportedly killed, including a Chinese engineer (BRN, 2011). This violence led to increased militarisation in and around the dam site, which enabled the project team to continue their work; at the same time, it negatively affected access to the area for local people (*ibid*). During this time period, an increase in project sizes, numbers of surveys and speech acts occurred alongside violence and Chinese involvement.

### Securitised Salween River, 2019 to 2022 (1: 4): Stage 12

Figure 7. Stage 12.



Thailand's water transfer scheme, known as the Yuam Water Diversion Project (YWDP), involves the extraction of around 1.8 billion cubic meters (m<sup>3</sup>) of water out of the Yuam tributary of the Salween for diversion into its domestic Chao Phraya basin (Thana, 2020; Priscoli and Wolf, 2009). The Royal Irrigation Department resubmitted an Environmental Social Impact Assessment to the Office of National Water Resources (ONWR), which was headed at the time by Dr. Somkiat Prajamwong, the former Director-General of the Royal Irrigation Department (RID). Dr. Somkiat is well networked in the Thai hydrocracy and had additional power as he reported directly to the Prime Minister through the ONWR (Interview 7, 2020).

After twice failing to receive ESIA approval, the Yuam Water Diversion Project was suddenly approved in October 2021 (Zsombor, 2021). The project had failed earlier due to its grandiose nature, which entails pumping water up to and through a mountain range and constructing an 8-metre-wide tunnel bore through the mountains to divert water to the Bhumipol Dam 62 km away (Deetes, 2020). The project will cross five national forest reserves and a pending national park (*ibid*). Riverine health is at risk as the project will connect two different river systems, with unknown implications for aquatic biodiversity.

Multiple public meetings for the diversion project were held in some of the over 36 communities that will be impacted by the project, with both Thai military and police present (Thana, 2020; Interview 8, 2020; Interview 10, 2020). The affected communities are mostly ethnic Karen, some of whom are

stateless; other communities are Thai but their residents often do not have land titles (Deetes, 2020; Thana, 2020). In both cases, there are mounting concerns over the resettlement process (*ibid*). Community awareness around the project is highly variable; some communities were given details while others learned of the multibillion-dollar scheme only when the media arrived in their village (Interview 10, 2020).

The sudden granting of approval for the YWDP after two failed ESAs, coincided with the Sit Tat's coup and occurred in the middle of the global Covid-19 pandemic. Thailand's decision to carry out the project during a period of Covid restrictions limited the local dissemination of information about the process. Thailand's unilateral decision to proceed with the project in a shared river basin thus occurred during a time when there was no possible assembly of a legitimate Burmese delegation that represented the six million citizens that call the Salween home. No transboundary water treaty for the Salween basin exists between the two nation-states that formally requires Thailand to consult the downstream actors (Middleton and Lamb, 2019).

Thailand is framing the international transfer as a domestic project and appears not to have consulted Burma's downstream states (Interview 12, 2020). The Thai-Burma border is not fully demarcated and Thailand frames projects as domestic (YWDP) or external (Hatgyi Dam) at their convenience, despite both projects being transboundary in nature (Lamb, 2014). The labelling as 'domestic' seems to have worked and within Myanmar there is generally no discussion or awareness of the re-emergent diversion scheme (Interview 1, 2020; Interview 12, 2020). This lack of awareness of the megaproject has most certainly increased since the coup and since the Sit Tat's systematic shutting down of the country's internet access. Domestically, members of 46 villages in Thailand have petitioned the military-led government to stop the YWDP due to concerns about the ESIA findings, the consultation process, and the impacts on their livelihood from loss of land, housing, and access to natural resources (*Bangkok Post*, 2022).

Weerakorn Khamprakorb, Thai Party MP in the military-civilian party (PPRP) and deputy chairman of the commission to study holistic water management, has made public statements that a Chinese corporation is willing to build the megaproject for 'free' (Deetes, 2022). This offer of a free or reduced rate is meant to obtain support for Chinese-led dam building projects on Myanmar's stretch of the Salween River, which are part of a 'Phase II' development scheme (*ibid*). The YWPD's diversion of water to the Chao Phraya basin will require intensive energy use, which helps justify the proposed Salween dams. In this way the YWDP is not just a domestic diversion of an international river; it is also linked to the Sit Tat's access to foreign reserves and to the immaterial hydropower megaprojects in Myanmar.

The Chinese company designated to build the Salween water transfer infrastructure was later identified as NORINCO, a state-owned defence corporation and arms manufacturer (Ocharoenchai and Duggleby, 2022). An arms dealer carrying out a water transfer project might sound odd but, as this application of TWINS has shown, it is elite highly securitised relationships that endure. NORINCO has not yet finalised a contract with Thailand, however it has multiple joint ventures with the Sit Tat's Myanmar Economic Holdings Limited (MEHL), one of the military's two principal conglomerates (Human Rights Council, 2019). NORINCO is one of the Sit Tat's main revenue sources through its subsidiary Myanmar Wanbao Mining Copper Ltd (Myanmar Wanbao). NORINCO owns the Monywa Letpadaung copper mine, but the mine is operated by Myanmar Wanbao. Myanmar Wanbao is on the US sanctions list and is one of the key revenue sources to the Sit Tat, providing over 400 million USD in the 2020-2021 fiscal year alone (PWYP, 2021). NORINCO also sells military arms and armoured vehicles and is the instrumental actor in supplying the Sit Tat with raw materials for weapons manufacturing (Human Rights Council, 2019; Special Advisory Council-Myanmar, 2023). This confirms the fears expressed in the 1990s by KNU officers, as quoted in this article, that is, a literal convergence of hydraulic infrastructure construction and the sale of arms to be used on Salween residents.

The YWDP project may not itself be economically viable, however it is not being pursued on its own merit. The project and its proponents are not evaluating the returns from the transfer per se; the project

is, rather, just a stop on the future trajectory of profits from a securitised relationship between the Thai and Burmese militaries, one which promises 'Phase II' deals with the Chinese around arms, extractives and future financialised infrastructure. Phase II of this initiative expands vastly on a loss-leading water diversion to include Salween mainstream dams (all held by Chinese developers), further water diversions from the Salween to central Thailand, the creation of an industrial zone on the Myanmar side of the border, and all of the auxiliary infrastructure construction entailed by these grandiose plans (Jumlongrach, 2021). Forty years after being proposed, the YWDP and the connected imagined dams are still defining the direction of the Salween.

## DISCUSSION

### Immaterial infrastructure

All these shifts in conflict and cooperation have occurred at the proposed hydraulic infrastructure sites even though concrete has yet to be poured. The hydropolitics literature mostly focuses on the effect of material infrastructure on conflict dynamics; it considers, for example, upstream and downstream relations and the ability of a state to control water flows. This study shows that hydraulic infrastructure can exhibit control and escalate conflict even in its immaterial or ideational form. Control of the development trajectory and narrative demarcates what is possible and what is left out, in the process creating tangible physical changes to the Salween landscape.

Official cooperation spurs direct and immediate forms of violence, with military occupation and displacements suddenly occurring near project sites. Infrastructure, even in its immaterial form, creates multidecadal forms of slow violence. Even when no project is under construction, Salween communities experience cycles of insecurity and reduced access to their landscape. This study displays the ways in which immaterial infrastructure impacts conflict dynamics in transboundary rivers; it shows how, even in the abstract, infrastructures can be conflict laden and violent. Further research on the immaterial power of hydraulic infrastructure over time is needed in order to more fully understand hydropolitical motivations and the ways in which these forces affect conflict dynamics (Zeitoun et al., 2011).

### Scalar mismatches

TWINS is able to capture how elite cooperation between Myanmar and Thailand coincides with escalating subnational conflict over the Salween River. This typically entails direct violence at project sites, while strengthening securitised relationships internationally. The inverse is also true, where many of the pushes to cooperate on joint infrastructure development in the Salween occur directly after civil unrest in Myanmar. Political upheaval, violence and low points in Myanmar-Thai relations are followed by renewed commitment to the joint development of hydropower. The Sit Tat understands that projects are beneficial tools in both cooperation and conquest, and utilises this to its advantage.

TWINS would have more difficulty illustrating the cooperation between central governments that leads to subnational conflict if the geographies were further apart and the river did not form the border. CSOs and media in Thailand made these conflictual realities and refugee flows more visible at times when subnational information in Myanmar was limited. TWINS is well suited to tracking 'speech acts' through official agreements, statements and centralised strategies that are more widely reported on; it is less effective at capturing the diverse ways in which these changes in cooperation and conflict dynamics are experienced locally.

We attempted to overcome the limitation of this central government focus by including grey literature and interviews with non-state actors. A more-specific local account was outside of the scope of this study. Such an account could, however, be captured through the addition of a third axis that accounted for violence (fast and slow) at a more local scale; visualising the occurrence of local violence against the backdrop of state-to-state relations could help overcome some of the scalar disconnect. This could fill in

gaps between speech acts and lived experiences, particularly near project sites. Access and information around the project sites are difficult to acquire and these experiences of conflict and cooperation are left out of the analysis unless picked up by the media or CSO researchers.

The international complexities of global finance also pose challenges to the TWINS analysis. Thailand is the key destination for both energy and water from the proposed Salween River basin infrastructure. Even though many would consider these projects to be 'Chinese', this application of TWINS has illustrated that Chinese SOEs are relatively new actors in this process. We thus chose to focus on the bilateral relationship between Myanmar and Thailand that has endured for over half a century. There are, however, key and often opaque financial flows that involve Singapore, China, EAOs, investors and consultancies outside of the basin. Distant third parties could be brought into the analysis by adding financial flows or diplomatic efforts, with actors outside the basin on a third axis, however the lack of financial transparency poses a significant challenge. There have been efforts to expand the TWINS model and the number of criteria in the matrix, as well to deepen the complexity of what the matrix can accommodate; financial flows would also be a welcome addition in accounting for scalar mismatches of influences from distant actors (Grünwald et al., 2020).

### **Foreclosed Salween futures**

There are many examples of alternate foreclosures of Salween futures. Thailand inflates its domestic energy forecasts and has done so for decades; this creates a false energy-demand figure that helps justify continued investment in hydropower in poorer neighbouring states (Permpongsacharoen, 2016). There is thus not a strong need for the proposed energy exports to Thailand from the Salween mainstream dams. In the Salween, this inflation of energy demand is accompanied by the downplaying of the nearly 6000 micro hydropower projects that are run by local entrepreneurs in decentralised energy systems in Myanmar (*ibid*). These well-established local energy systems mean that Myanmar has the most advanced off-grid renewable energy production in all of Southeast Asia as well as the largest number of experienced energy entrepreneurs (Hivos, 2021).

There is no provision for existing small-scale energy entrepreneurs to connect to the national grid. This decentralised energy reality is not conducive to grandiose megaprojects or national grid extension loans. The narrative instead starts with how energy poor Myanmar is or how energy cuts hurt the Burmese economy and therefore how large-scale hydropower is the inevitable solution. What is intentionally left out of the top-down development narrative is the fact that the ethnic areas that stand to be displaced by the dams already have thousands of off-grid electricity arrangements.

A bottom-up alternative approach to environmental governance is the creation of the Salween Peace Park (SPP). The SPP is an alternative to top-down militarised development strategies, with Indigenous groups from three townships jointly conserving and managing a 5485 km<sup>2</sup> area (Saw Paul Sein Twa et al., 2021). The initiative is community centred and has experienced a groundswell of support and success as a form of Salween environmental governance (*ibid*). It is an example of an Indigenous Protected and Conserved Area (IPCA) and, with nearly 70,000 people, it is one of the largest Indigenous-led governance systems in the world (Paul and KESAN, 2022).

The SPP is located within the proposed Hatgyi mainstream dam site. It is in direct opposition to the large-scale hydropower development that is escalating conflict in the area (Suhardiman et al., 2017). It stands as a direct challenge to the development strategy pursued by the Sit Tat and presents a promising alternative. In 2021, the SPP was attacked and its headquarters bombed in multiple Sit Tat airstrikes; unarmed civilians were killed and injured and the park's infrastructure was damaged (KESAN, 2021).

### **Infrastructure's illiberal signal**

The Sit Tat views these large-scale dams as illiberal technologies. In 2011, it paused the Myitsone dam<sup>1</sup> in the Ayeyarwady basin in order to indicate a turning away from reliance on authoritarian alliances with China and Thailand and to signal an opening for Western diplomacy and investment (Kiik, 2016). After the coup, the Sit Tat again directly employed hydropower projects as signposts of a return to illiberal governance; they served as a reminder to old allies of the profits that could be made by aligning, and working, with the Sit Tat.

Less than a month after launching the coup, coup leader Min Aung Hlaing floated the resumption of the Myitsone dam project to placate Chinese interests (Currie, 2021). On his first official mission, amidst nationwide revolt, Min Aung Hlaing travelled to the Salween basin to call for the resumption of the Hatgyi dam project on the Salween, which would sell energy to Thailand (Lin Htet Myat, 2021). Neither of the project restart announcements is realistic at this time, but they signal to the Sit Tat's authoritarian allies that there is 'potential to profit' in the future.

These relationships with China and Thailand foster legitimacy and motivate the defence of the Sit Tat in international arenas. This pseudo-legitimacy is mediated by the violent and cheap selling off of profitable natural resources in the Salween borderlands. From these patterns of behaviour, it is clear that the generals understand these dams and the future pathways they embody as being illiberal, that is, not aligned with democratic values and visions for the country. They deploy the dams as signals of their international intentions and use them to hold together securitised alliances.

### **Conflictual cooperation**

These developments show that the infrastructure and relationships in the Salween began with violent military involvement in the 1950s and that they remain highly securitised today. All of the current proponents of hydraulic projects have direct links to the Thai or Burmese military. Proponents discuss energy and water security or economic development as motivations for cooperating in the construction of infrastructure. Through the tracing of these interactions over decades, however, TWINS has illustrated that these projects are securitised, working both as a weapon for territorial control and a value extraction vehicle to enrich generals on both sides of the river.

This application of TWINS challenges positivist notions of cooperation through joint infrastructure construction (Sadoff and Grey, 2005). Attempts to cooperate lead to violence near contested dam sites while also providing legitimacy and funding to a despotic regime when facing political crises. There is a clear scalar disconnect between official state-to-state cooperation that is couched as international diplomacy and the conflictual realities at subnational levels that these processes both drive and help to maintain. TWINS allows for these cooperative and conflictual events to coexist. The model illustrates how attempts at cooperative infrastructure development in the contested Salween landscape have elevated conflict and violence in the past and how they support a securitised Salween into the future.

### **CONCLUSION**

In the face of this turmoil, the resilience of the hydrocracy and hydraulic infrastructure schemes is remarkable. It is important to position these Salween events within the broader political economy. The persistence of these projects is set against one of the oldest and most complex conflicts in the world, which is still ongoing in Myanmar, as well as against the end of the Cold War, nine coups in Thailand, the Asian financial crisis, the rise of China, the global financial crisis, a global pandemic, and the most recent

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<sup>1</sup> The Myitsone project is in a separate river basin; it has a context and history which is much different and could not be accommodated by the scope of this Salween study. Parallels can be observed, however, in Myanmar's experience with hydropower projects, and more information around the case can be found in papers by Kiik (2016, 2020, 2023).

2021 coup by the Sit Tat (Tsang, 2014; Deetes, 2020; Middleton and Lamb, 2019). The hydrocracy is not just resilient to risk; it is seemingly also impervious to changes in the broader political economy. Once conceived of and imbued with speech acts – even if never built – the projects and proponents remain.

Instead of being the pinnacle of water cooperation, hydraulic infrastructure in the Mekong region is viewed as a vehicle that serves the primary purpose of value extraction (Merme et al., 2014; Ahlers and Merme, 2016). Through these infrastructure processes, value accumulates for a small group of elite actors while socialising the losses onto the larger society, which typically shifts costs onto the most vulnerable communities (Blake and Barney, 2018; Käkönen and Thuon, 2019; Matthews, 2012; Menga and Swyngedouw, 2018; Middleton, 2022; Sneddon, 2007). The Sit Tat seeks to sell off rich natural resource areas of the Salween landscape in exchange for legitimacy and foreign reserves from Thai and Chinese allies. In this light, the supposed shared benefits of water or energy management are inadequate as an explanation or as a lens through which to explore drivers of hydropower development; such concerns are surpassed by matters of finance, conquest and securitised alliances beyond the river.

The TWINS model reveals patterns of interaction between hydraulic infrastructure and conflict, where cooperation around contested infrastructure increases conflict. We attempted to move TWINS beyond a state-to-state analysis through analysing grey literature and through interviews with non-state actors familiar with the Salween River. Decades of work by Salween CSOs and academics illustrate the direct links between violence and hydraulic infrastructure, findings that were confirmed by the IFC's Strategic Environmental Assessment on hydropower in Myanmar (Middleton and Lamb, 2019; IFC, 2017). While the project proponents have shifted somewhat over time, the tracing of the history of these projects illustrates the enduring nature of their violent processes. Even with no physical changes to the Salween River's flows, the pursuit of these infrastructures will consistently bring more instability and conflict to the Salween landscape. There is a need for further research on the immaterial forms of infrastructure and on infrastructure speculation and its relation to conflict and cooperation dynamics. Even without being built, these infrastructures are reordering landscapes and impacting conflict outcomes.

## ACKNOWLEDGEMENTS

The author has received funding from the European Union's Horizon 2020 research and innovation programme under the Marie Skłodowska-Curie Innovative Training Network NEWAVE – grant agreement No 861509. Interviewee engagement was conducted with ethics clearance and responses have been coded to protect anonymity. A special thanks to all of those who took time to speak on the subject.

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