DISPLACING DISASTERS: THE POLITICS OF LOCALIZED STRUGGLES TO (RE)POSITION RIVER TRAINING INFRASTRUCTURE AND (RE)DISTRIBUTE VULNERABILITY ALONG NEPAL'S LOWER KARNALI RIVERBANKS

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Introduction: River Training Wars in the Lower Karnali Basin

The Karnali River's braided arms fan into a vast inland delta as they pour from the Himalayan foothills and spread onto southwestern Nepal's alluvial floodplain. In 2008, the river's main channel shifted west around the head of Rajapur Island, a triangular landmass situated on the western edge of Bardiya District in the middle of the Karnali River and home to nearly 100,000 people (Gill 2016) [Figure 1]. This hydrological change was not unprecedented for a river with a discharge that fluctuates from 173 cubic meters per second (m^3/s) in the dry season to 16,000 m^3/s during monsoon (Pradhan and Belbase 2018), and that adjusts major and minor channels at least once a decade. However, powerful landowners and political leaders of Tikapur, a growing city on the Karnali's western branch across the river from Rajapur, had grown tired of the river's transient nature and frequent avulsions. Leveraging their networks in Kathmandu, these individuals were able to convince the Department of Water Induced Disaster Management (DWIDM) to intervene and armor Tikapur with embankments in 2010 and 2011 to relieve them from aggressive bank carving and inundation. While this structural response to flooding through river training works follows a broader trend in South Asia (Mishra 1997; Dixit 2003; Dixit *et al*. 2007), this was the first time the approach had been employed in the Karnali Basin.

Since Tikapur's embankments were built, local farmers are convinced that there has been less erosion and inundation on their side of the river. However, Rajapur residents claim that Tikapur's protection has occurred at their expense by structurally deflecting the Karnli's current toward them. Soon after Tikapur erected its embankments, island residents describe how the braided channels of the Karnali's west branch shifted closer to Rajapur and

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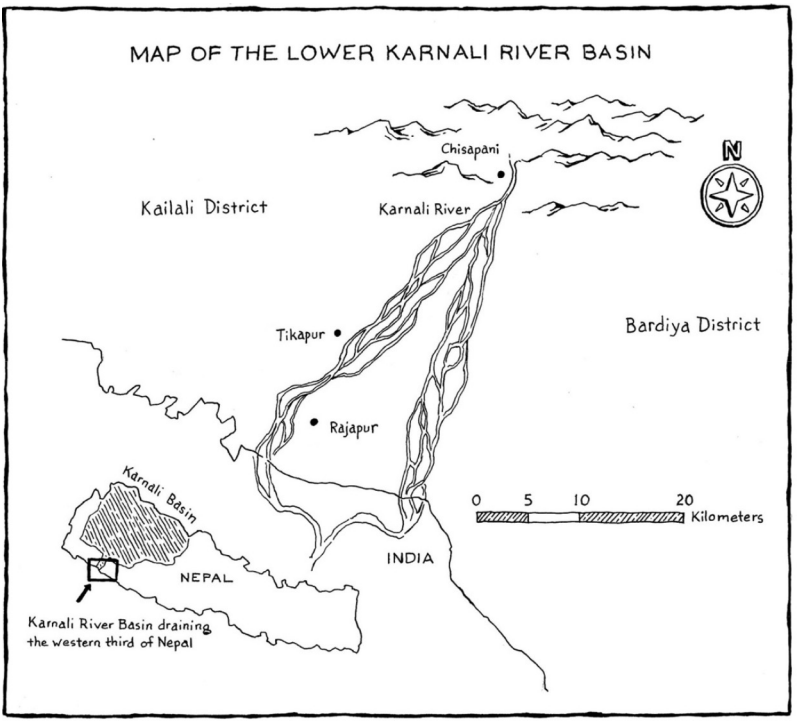

Figure 1: A map illustrating the lower Karnali River Basin and the island of Rajapur. Map by Bryce Gladfelter Illustration; originally published in Gladfelter (2018).

began eating away its most vulnerable edges. Villagers of Tiuni, for example, report having lost 14 hectares of community forest in the course of just a few years, while nearby Tighra watched over 50 hectares of collectively owned forests and private land erode into the river. Despite this chronic erosion of land, it was not until a massive flood struck the Karnali Basin in August 2014, leaving over 14,500 homes destroyed or damaged across Bardiya District (Zurich 2015) that a powerful discourse of infrastructural violence and state abandonment finally solidified in Rajapur,[1] mobilizing DWIDM

[1] While some of Rajapur's most devastated communities during the 2014 flood were those living along the island's unprotected riverbanks across from Tikapur, it remains unclear if, and to what extent, these impacts can be linked to infrastructure. As a fluvial geomorphologist contracted to examine the Karnali's changing hydrology, explained to me in 2018, flow deflection structures like Tikapur's embankments

to respond. Later that year, DWIDM established an office in Rajapur and broke ground on the $115 million Karnali River Training Project (KRTP), a massive infrastructure project that would armor Rajapur with over 40 kilometers of embankments. This belt of four-meter-high, five-meter-wide walls packed with stone and supported by hundreds of spurs extending into the river promises island residents protection from disaster by reinforcing boundaries between the river and land (Image 1).

Image 1: This embankment was built during the Karnali River Training Project's first year of construction to deflect the river back toward Tikapur, directly across the river and from where this canoe ferry is coming (Photo by author).

Informed by more than five months of qualitative research conducted over the course of three years (2015, 2016, and 2018), this paper critically

typically alter a river's flow path for only a short distance downstream so it is unlikely that Tikapur's embankments would have deflected the river's current as far as its opposite bank. What is more likely, however, is that Tikapur's embankments silted in one braided channel of the Karnali's west branch and forced its flow into another braid that extended to the far side of the channel, where it carved into Rajapur unprotected banks. Moreover, by reducing the Karnali's floodplain, Tikapur's embankments may have energized and raised water levels during the 2014 flood, exacerbating damages on the island.

examines how floods have become—or rather have been *made*—disasters, particularly for certain people in the lower Karnali Basin. It also explores how this history has repercussions today as the KRTP's embankments continue to divide and protect communities along existing fault lines of inequality. In this way, I illustrate the uneven nature of vulnerability; I consider the distribution of vulnerability in Rajapur, both past and present, engaging an understanding of vulnerability as "the characteristics of a person or group and their situation that influence their capacity to anticipate, cope with, resist and recover from the impact of a natural hazard" (Wisner *et al*. 2004: 11).

Following Dixit's (2003) call to approach flood vulnerability in Nepal through an in-depth accounting of causality, I begin this article with a brief history of Rajapur's historical patterns of settlement and dispossession that "prefigure disaster" (Hewitt 1983: 27). My approach follows anthropologists (Faas 2016; Sun and Faas 2018) and political ecologists (Peet, Robbins and Watts 2011: 36) who assert that any critical investigation of disaster needs to not only attend "to the very real political fault-lines across which vulnerability is distributed, but also draw attention to the ways any characterization of such outcomes as 'natural' is itself a dangerous form of representation." Vulnerability, after all, "does not fall from the sky," but rather, is by definition, the social precarity already found on the ground when a hazard arrives (Ribot 2014: 667). Uncovering the roots of vulnerability then requires taking a structured look at "how and why societies place and leave certain categories of people at risk" (Ribot 2014: 670).

I draw on ethnographic data to reveal the historical, place-based production of vulnerability in the lower Karnali Basin and how both distal and proximate causes continue to position historically marginalized populations in dangerous, flood-prone places. These individuals are also those with the least capacity to resist dispossession when embankments are erected to protect their communities from flooding. I argue that specific policies have helped to *make* floods disasters in Rajapur by exacerbating the precarity of specific groups positioned to be struck harder by the localized effects of inundation. This outcome results from a combination of social policies and economic processes that enabled the KRTP to become the seemingly only solution to local inundation problems by rendering impossible alternative ways of living with the river.

From this historical context and critical perspective on the making of disasters, I move into the contemporary dynamics of the KRTP's

implementation. This involves tracing how infrastructure distributes protection unevenly on local bodies and how people, differentially positioned according to caste and class on the island, struggle to (re)align themselves geographically, socially, and politically in search of long-term security. Embankments in Rajapur—like many types of infrastructure—become "critical sites for the distribution of life" (Appel, Anand and Gupta 2018: 21). Rock walls divide communities and recode the value of people's lives (Cortesi 2018), promising protection to some while sacrificing others. The position of embankments and who they serve is determined through ongoing power negotiations as "technologies of politics and the politics of technology" articulate on the ground (Appel, Anand and Gupta 2018: 14).

I focus on local protests over the placement of embankments in the communities of Daulatpur, Prem Nagar, and Rajipur to show how contemporary infrastructure projects, like the KRTP, draw differentially positioned actors into relation with each other and forge new political constellations (Carse and Kneas 2019). In many cases, intra-village struggles over the position of infrastructure are not only shaped by, but also further entrench existing geographies of marginalization and dispossession. In my analysis, however, I do not suggest that Rajapur's most vulnerable people are passive victims to flood exposure and dispossession (as cautioned by Faas 2016 and Gaillard 2019). Rather, in examining political dynamics across three years of the KRTP's development, this article highlights the many ways in which Rajapur's most marginalized people actively struggle and leverage their agency, albeit radically circumscribed, to protect their security and rights as embankments are erected.

Finally, by drawing attention to infrastructure and its enactment, this article both accounts for the social, political, and material effects of the KRTP specifically and informs broader research on disaster vulnerability and the politics of infrastructure more generally. It does so by contributing an analysis of the ways in which people benefit unevenly from supposed infrastructural "solutions" to disaster, not only as, but also after, they are erected. In this way, I stress the often-overlooked temporal dimensions of protection by arguing that the dynamics of winning and losing from structural solutions to disaster are in constant flux. These dynamics evolve over time as infrastructure is allowed to stand and gradually serve or fail certain people more than others.

Research Site Selection and Methods

This article is based on more than five months of qualitative fieldwork, including a total of 25 focus group discussions and 200 interviews, conducted in villages impacted by the KRTP. Most data collection occurred in July 2015 and from August to December 2016. A more detailed discussion of this study, including my selection of Rajapur Island as a research site and its history of inundation, is available elsewhere (Gladfelter 2017). In June 2018, I returned to Rajapur to follow-up on the status of the KRTP's construction and meet with impacted communities that had been protesting the project in 2016. This visit also allowed for follow-up interviews with local leaders and government engineers to understand how the KRTP has evolved overtime and what compromises have been made in its implementation.

During research, I accessed interlocutors with specific expertise on the KRTP's design and implementation by interviewing engineers and officers at DWIDM and other relevant government offices. In 2015 and 2016, I had the opportunity to go to Rajapur Island with various engineers and conducted extensive interviews with three different project managers who had responsibility for the KRTP over the course of this study. To obtain a more grounded perspective on how construction plays out in communities, I also spent several months visiting those places on Rajapur Island where the KRTP had embankments actively under construction. In each, I interviewed village leaders for a local history of implementation, including any relevant protests, and cross-referenced this information with interviews and household surveys conducted in communities physically located in the path of construction.

In the course of this fieldwork, I identified several villages for particular focus that were deeply enmeshed in protests and negotiations with DWIDM or struggling with their own internal disagreements over the path that the KRTP should take through their community. Thus, I documented the KRTP's construction process over time through several village case studies. Three years of research along construction sites of the KRTP has enabled a longitudinal perspective and comparative data on how diverse communities are impacted by both the politics and infrastructure of flood "solutions."

Patterns of Dispossession and the Hegemony of Structural Intervention in Rajapur

After functioning as a technical center coordinated jointly by the governments of Nepal and Japan from 1991, the Department of Water Induced Disaster

Prevention (DWIDP) was established in 2000 and merged with the Department of Irrigation's River Training Division with a mandate to "prevent, manage and mitigate the problems of water induced disasters." This institutional marriage continues to shape a technocratic approach to managing floods today. As in much of the world, infrastructure used to tame waterways for irrigation and flood prevention can be interpreted as civilizing people as much as serving them: increasing productivity and folding labor and crops into cash-based economies (Sneddon 2015, see also Mishra 1997; Dixit 2003).[2] In 2015, DWIDP was renamed the humbler Department of Water Induced Disaster Management (DWIDM). Yet, DWIDM has continued to function as a powerful state "hydrocracy" or water bureaucracy (Molle, Mollinga and Wester 2009), populated largely by civil engineers who, as Nepali scholar Dipak Gyawali (2011) once claimed in an interview, "are trained to think only in concrete."

Prior to DWIDM's establishment, however, floods in Nepal were not defined so narrowly. Rather than strictly disasters, many people, particularly farmers, understood them as complex phenomena that caused occasional devastation, but that also had productive and generative qualities. The Island of Rajapur itself is a case in point, having been formed and sculpted over the centuries by sediment-laden floodwaters and the Karnali's continuous vacillations. Fertility here, like in many places across the Gangetic Plain (see Dixit 2003, 2009; Sinha 2008; Cortesi 2018; D'Souza 2020), has always depended on the freedom of the river to wander its floodplain.

Rajapur's first inhabitants recognized the productive value of floods. For the indigenous Sonaha, who historically lived along the Karnali fishing its eddies and collecting gold from its sandbars, monsoonal flooding and associated bank carving were not considered disasters. Rather, interviews within Sonaha communities still occupying the island indicate that these processes were essential to their livelihoods as the river's swollen waters carried gold particles out of the hills and supported local fisheries. The Tharu, a semi-nomadic people who reportedly migrated to Rajapur several centuries

[2] India began jacketing its rivers in earnest upon gaining independence in 1947 and has constructed more than 33,630 km of embankments since (Dixit 2009). While Indian engineers were aware of the profound failures of embankments elsewhere in the world, river training was seen by Prime Minister Nehru as the epitome of the modern and became a mechanism to civilize India and its people through the extension of irrigation canals and other infrastructure that followed (Mishra1997; Dixit 2003).

ago,[3] also relied on the Karnali River for irrigation and monsoonal floods to wash silt into their paddies. Over time, both groups developed creative ways to both take advantage of and live with inundation (Image 2). In a sparsely populated region without private land tenure practices, migratory practices allowed the Sonaha and Tharu to shift their homes and places of livelihood along with the river. Bank carving did not dispossess them in the same way it does today. Rather, when land eroded, people moved elsewhere.

Image 2: Tharu residents of Rajapur spend an afternoon fishing the Karnali River's currents (Photo by author).

"Land was rarely lost forever," one Tharu farmer explained, "if the river claimed it for some time, eventually it was returned." He shared the story of a neighbor who lost his fields to bank carving, only to regain them when the Karnali shifted a decade later. He and many others understood this relationship between the land and river as a give and take—certainly not without suffering, but an exchange that was essential to the island's fertility and their livelihoods.

[3] Oral histories were collected from direct descendants of the first Tharu families that settled Rajapur Island and with individuals from the Sonaha community who were present in Rajapur prior to its settlement by the Tharu.

It was not until Rajapur's land was claimed, divided, and institutionalized as private property that floods began to spell disaster for residents who were forced by laws like the 1956 Land and Cultivation Record Compilation Act to settle definitively in one place. Previously, the Sonaha and Tharu's relative immunity to mosquito-borne diseases had enabled them to settle Nepal's jungles and floodplains with limited competition for centuries and protect their land from encroachment by outside populations (Guneratne 2002). By the early twentieth century, however, Rana rulers had extended their reach over much of rural Nepal, distributing vast tracks of the Tarai to Kathmandu elites. These land grants, along with aggressive malaria eradication programs in the 1950s, enabled people from the densely populated hills to migrate to the plains and settle there in large numbers (Rankin 1999; Guneratne 2002). In the process, much of Rajapur was captured from the Sonaha and Tharu.

Not being farmers who worked the land, the Sonaha were most easily displaced. Many became landless, or *sukumbāsī,* and settled initially on the state-owned riverbanks. As the shores eroded, however, the Sonaha could no longer back away from the river as the rest of the island was owned. In this way, the institutionalization of private property *made* bank carving a disaster as people were pinned to a landscape that remained fluid around them. With time, many Tharu also found themselves dually dispossessed: not only tricked into selling or giving away their land, but also forced into debt and later bondage through their own *kamaiyā* labor system. This form of bondage, traditionally temporary and arranged between neighbors and relatives, had primarily served as a social safety net in Tharu society to ensure that indebted families were fed and sheltered as adults labored to pay their debts (Rankin 1999). However, as the *kamaiyā* system was appropriated and extended into a semi-permanent status by powerful elite and absentee landlords, many of Rajapur's Tharu residents essentially became life-long slaves. Their debt became perennial, their bondage multi-generational.

Though little has been written on Rajapur's unique history (Kocanda and Puhakka 2012), oral sources describe the island as having had one of Nepal's largest populations of *kamaiyā* laborers, with several hundred powerful landlords each controlling a small village of workers. When Nepal's *kamaiyā*s were finally freed by a decree in 2000, most land in cultivation remained in the landlords' hands. This resulted in 15,000 to 20,000 households becoming homeless and jobless on the island overnight. As Nepal's central government was consumed in a violent civil war (1996–2006), Rajapur's *mukta* (freed)

*kamaiyā*s were forced to build temporary shelters on whatever *ailānī* (public) land they could find. Controlled by Kathmandu and seen as nothing more than wasteland, these water-logged roadsides and flood-prone riverbanks would eventually become private property granted to each state-registered *kamaiyā* family. Yet this process of distribution, initiated in 2001, but still incomplete nearly 20 years later, has essentially exiled thousands of Rajapur's most vulnerable residents to the island's margins where their precarious position has become permanent.

Unsurprisingly, inundation and bank carving swiftly became disasters for those trying to survive on Rajapur's vulnerable edges. For many, the daily struggle of living with floods was worsened by the fact that, in 1996, community forests across the island were designated part of Bardiya National Park (BNP)'s buffer zone. Through this enclosure of communal land in the name of conservation, cutting trees and even gathering driftwood was criminalized. Thus, deprived of access to local forests which otherwise provide an essential source of free, renewable construction materials, the cost of wood became too prohibitive for the Sonaha to build traditional, two-story homes. As a result, frequent floods and subsequent rebuilding have pushed many households into debt, as each year they take out loans at interest rates of 18–24 percent to rebuild.[4] Men in many households are forced to migrate just to pay these bills, exemplifying how vulnerability deepens through "patterns of frequent stress" (Wisner *et al.* 2004: 5).

Today, Rajapur remains demographically dominated by Tharu, who comprise 80 percent of the island's population (Gill 2016). Nevertheless, many continue to labor as poorly paid sharecroppers on others' land. As for the Sonaha, reportedly only 150 households remain on the island, while most migrate to India for wage labor as traditional livelihoods of fishing and gold collecting are illegal within BNP's buffer zone. Although little data exists on Rajapur's *sukumbāsī* (landless) and *mukta kamaiyā* populations, one ex-*kamaiyā* activist and founder of the local NGO, Kamaiya Mahila Jagaran Samaj, estimates that there are 70,000–75,000 such dispossessed people living across the island today (Image 3). Ninety-five percent continue to occupy Rajapur's most flood-prone margins. In this way, layered histories of social, political, and material dispossession explain, at least in part, how

[4] Pritchard and Thielemans (2014: 336) document a similar trend among communities of scheduled castes in Bihar, India who face chronic flooding and the long-term consequences of embankment construction.

people came to experience floods as disasters in Rajapur and how erecting infrastructure to protect property owners came to seem not only justified, but necessary.

Image 3: Tharu residents without sufficient land to feed their families often work as wage laborers harvesting crops by hand for wealthy landowners. Many of these individuals were once bonded kamaiyā*s who sometimes work for the same individuals who once held them in bondage (Photo by author).*

While the "necessity" of the KRTP has in many ways become "normalized and internalized" by most of Rajapur's residents (Peet, Robbins and Watts 2011: 40), it is important to recognize how the fallout of the island's complex social, political, and economic history aligned with the interests of local elites to make embankments a hegemonic solution to inundation in the first place. Through changes in land tenure, native populations were structurally dispossessed and forced to settle the island's vulnerable edges. As private property fixed semi-nomadic peoples to a single location, alternative ways of living with and adapting to inundation were structurally displaced and *made* no longer possible. In this way, the pervasive conviction that, "there is no alternative" to embankments to borrow the language of Lyla Mehta (2001), is not only a matter of discursive hegemony manufactured by hydrocrats, engineers, and Rajapur's political elite, but also a material reality that has

emerged as the island's most vulnerable people have been gradually pushed into more precarious places and dispossessed of other viable options.[5]

Moreover, once Tikapur's embankments were built across the river and Rajapur's vulnerable farmland continued to erode, many local leaders largely interested in increasing their own access to government contracts, stepped up to advocate for more investment in Rajapur's development. They told people that if they wanted to preserve their limited property, they too would have to armor their farmland with embankments. The only way to respond to flood disasters exacerbated by infrastructure across the river in Tikapur, they argued, was if Rajapur had its own larger, more extensive structures. In the end, the island's most marginal farmers and indebted *sukumbāsī*s, possessing only scraps of land, if any, and unable to access local forests to rebuild, were left with no choice but to place their faith in technology's capacity to secure their land.

"When the contractors come, we go to protest," a Sonaha woman confessed in an interview in 2016, explaining her frustration over how much land is taken without compensation for building river training works. "But in the end, we know we will have to agree because we *need* the embankment." Thus, as embankments have solidified in Rajapur as the island's only option to cope with inundation, people's agency and scope of resistance to the KRTP has become limited to a politics of positioning, or how they are situated *within* an already accepted "solution."

The Politics of Position

Since the KRTP's first year of implementation, farmer agitations like the one mentioned by the Sonaha woman above have erupted on construction sites across the island. These protests, however, have emerged not as critiques of DWIDM's approach to training rivers, but rather within a broader tug-of-war over the alignment of embankments and the path they take through each community. After all, where each embankment is constructed determines not only whose land is protected and whose is left vulnerable to inundation,

[5] Devkota *et al.* (2013) describe a similar pattern along Nepal's West Rapti River where many people living on the floodplains are also poor and indigenous. The authors discuss the limited capacity that these communities have to respond to floods but focus on *who* is vulnerable rather than *why* and do not examine historical patterns of dispossession or the contemporary social and political context that continues to reproduce their vulnerability.

but also whose land is taken to build the embankments. As is the case with most development interventions, these are political battles that individuals participate in and are excluded from in radically uneven ways (Peet, Robbins and Watts 2011; Robbins 2011). Residents who are differentially empowered and disempowered, attempt to control where construction will take place, who the structures will displace, and whose land will be sacrificed in the process. After all, as I show below, it is how these individuals end up positioned in relation to embankments at the most micro scale that often determines whether or not the structures relieve or exacerbate their specific vulnerability.

While the KRTP is a formal response to resident delegations and requests for flood protection, its implementation still functions as a top-down "solution" imposed upon communities. Led directly by the central government's DWIDM in Kathmandu, representatives from the island's village units (Village Development Committees) reported that KRTP project managers and engineers rarely coordinate or share their plans with local government officials, let alone residents directly impacted by construction. Thus, while rumors percolate in villages preceding construction, the exact location and timing of proposed embankments remains uncertain to the local population. Consequently, most residents only discover how the KRTP will affect them when contractors show up with equipment in their fields (Image 4). At this point, however, there is little they can to do to resist their dispossession as land is taken from them under threat of abandoning embankment construction altogether.

Some small landholders in alliance with strong local leaders have been able to resist displacement and protect a greater portion of their property by demanding that embankments be built along the river's edge. However, in villages where only the most marginalized *mukta kamaiyā* and *sukumbāsī* households stand to be negatively impacted by construction, political leaders are often less willing to intervene and negotiate with engineers on their behalf. In these situations, it is not uncommon for the most vulnerable households to be coerced by their own neighbors into accepting structures on their land as a sacrifice for the broader community's benefit. This injustice is exacerbated by the fact that, at the time of research at least, there was no government fund to compensate residents for land lost in the construction of river training works.

Image 4: An excavator rips into the riverbank at an active construction site of the Karnali River Training Project (Photo by author).

In theory, DWIDM engineers are supposed to design and position embankments based on empirical calculations that both account for natural fluctuations in the river's flow while also securing the greatest number of residents. The reality, however, is that engineers are often dragged into compromises with local elites who intervene at the site of construction to better secure their own land and supporters. Based on Nepal and India's standard method for calculating the minimum distance between two embankments (Singh 1980) and consultation with KRTP engineers,[6] the Karnali's west branch which divides Tikapur and Rajapur should require a 1,500-meter-wide channel to contain a 50-year flood without breaching. The reality, however, is that rather than building structures sufficiently inland to provide space for the river to swell during floods, DWIDM has erected 90 percent of embankments directly on the riverbank or through its bed to accommodate landowners who have already lost property to bank carving and refuse to give up more.[7]

[6] Lacey's formula assumes that the width of a natural channel at bankfull flow is proportional to the root of the discharge and requires embankments to be built 1.5 to 3 times the Lacey's width (L) from the river's central line.

[7] Personal communication with KRTP project manager and engineer.

During the KRTP's initial years of construction, such concessions did not come without a fight from DWIDM as project engineers struggled to defend the KRTP's placement on the grounds of technical feasibility. When I interviewed the project's first manager in 2015, for example, he was openly anxious about the structural compromises he had already been forced to make, wondering if the project's attempt to reclaim six hectares of farmland lost in the 2014 flood, "might ultimately do more harm than good." "As much as we try to use our technical knowledge," he lamented, "to have public cooperation, we *have* to work with local leaders." As Praveen Singh (2008) and Rohan D'Souza (2006) find in their examination of embankment construction in North Bihar and East India, engineers are frequently forced to compromise their technical designs and expertise to meet the political interests of revenue officers and landed elite.

Just three years later, DWIDM's tone had shifted dramatically. Rather than actively resisting the ways in which local politics were influencing the KRTP's placement and potentially compromising its capacity to provide flood protection, the new manager, Ram Singh, fully embraced his role serving Rajapur' leaders in opposition to those in Tikapur. During a conversation in 2018, he spoke with the tone of a military general explaining how Rajapur's embankments were being enrolled in a river training war across district boundaries.[8]

"When Tikapur constructed their embankments, they made a mistake," Singh asserted. "They didn't consult with Rajapur's leaders nor allow space for the Karnali River." "The people of Rajapur don't need to worry though," he continued assuredly. "The embankments we are building today are two and a half meters higher than Tikapur's. If a flood comes, it will spill toward them."

In this new vision for training the Karnali River, embankments are being used in ways never technically intended: weaponized to fight with the river and struggle over land already taken.[9] In this context, land reclamation is

[8] Individuals mentioned by name have been given pseudonyms to protect their privacy.

[9] River training wars in South Asia are not unprecedented. Singh (2008: 248) describes a conflict escalating between Bhagalpur and Darbhanga Districts divided by the Tiljuga River in North India: "The process was contagious. The construction of one embankment by a zamindar in a stretch of the river was met with embankments in the remaining stretch put up by another zamindar." Eventually, competitive

no longer framed as a politically necessity albeit problematic practice from an engineering perspective. In fact, in a revised master plan that Singh had recently submitted to DWIDM, land reclamation was defined as a key objective and celebrated as one of the most important benefits of the KRTP. If approved, the plan will support 16.5 additional kilometers of embankments.

"Wherever possible, we are reclaiming farmland," Singh explained, citing how the KRTP has regained half an acre of floodplain in Tiuni village alone. "Over 44 hectares of land have been captured from the Karnali so far and we have aggressive plans to increase this to several hundred hectares soon." While it should be noted that most of this land remains waterlogged and unusable by local farmers, Singh understands that the promise alone has power. By offering to reclaim farmers' land, he can build political buy-in for the project and deflect local protests.

As embankments are increasingly built directly on the river's edge, however, it is Rajapur's most vulnerable residents who are forced to sacrifice the most for promises of structural protection. Many *mukta kamaiyā*s and *sukumbāsī*s, after all, continue to live on the island's riverbanks directly in the KRTP's path—either squatting there informally or as legal owners of flood-prone plots formally granted to them by the government after emancipation.

Moreover, *sukumbāsī* households without land titles technically have no legal right to the land on which they live and therefore have limited capacity to resist their displacement and dispossession by embankments. Taking advantage of this vulnerability, some local leaders more concerned with securing their own political following, have channeled the larger community's fear and collective desire for protection to coerce its most marginal members, like the *sukumbāsī*s, into consenting to their own loss for the "greater good."

This is a pattern repeated in villages across the island. Contractors threaten to leave people exposed and build embankments only in cooperative villages if they do not agree to give up their land and let construction proceed. Residents panic. A sense of uncertainty surrounding the KRTP's top-down implementation, which starts and stops without warning, exacerbates local anxieties of abandonment. Desperate to secure their own rapidly eroding assets, many farmers described being intimidated into believing that to demand anything is to risk losing protection. Thus, many households only

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construction saw violent repercussions, "with contending parties trying to breach the others' embankments while at the same time protecting their own" (Singh 2008: 251).

slightly better off than their landless neighbors smother any protest that threatens to delay construction.

These power relations reveal that politics lie at the heart of how embankments are positioned along the Karnali River and who specifically they secure in each community. As Robbins (2011) and other political ecologists have long asserted, there are always winners and losers in the enactment of any "solution" to environmental problems. Thus, in Rajapur, it is unsurprising that the most powerful landowners and political elite benefit most from the KRTP while the most vulnerable bear the greatest burden. This situation further supports and extends an argument put forth by D'Souza (2020: 38–39): that flood control projects across India have been ideologically driven and intended to defend bourgeois landed property.

Just as disasters are not produced through one's random exposure to a natural hazard, but rather as that hazard crashes into underlying patterns of social vulnerability (Dixit 2003; Wisner *et al.* 2004), structural solutions to flooding largely secure those landed elites who are already positioned to benefit most from them. Communities, after all, are fractured and uneven from within (Peet, Robbins and Watts 2011). Therefore, when embankments shaped by existing power structures are erected and extended in Rajapur, they become what Pritchard and Thielemans (2014: 327) have called "devices for perpetuating privilege." By both physically and metaphorically dividing communities again, they end up deepening and further entrenching, rather than ameliorating, the island's uneven topography of vulnerability. This is a process that I unpack next through the stories of two villages segregated by the KRTP.

Intra-community Struggles on the Edge of Disaster

Daulatpur

Daulatpur sits on the west branch of the Karnali, across the river from Tikapur. It is also home to one of Rajapur's most powerful political leaders. When DWIDM's engineers first came to survey a path for the KRTP here in 2014, they determined that the embankment would need to cut straight through the village in order to accommodate a 1,500-meter buffer for the river. Since the Karnali narrows here significantly and Tikapur had already built structures across the channel, maintaining this distance would have required abandoning an 800-meter swath of the village to flooding and

bank cutting. More solemn still was the fact that in this "sacrifice zone" (Povinelli 2011) between the two embankments were nearly 200 households of subsistence and *kamaiyā* families.

These people on Daulatpur's margins were shocked when they learned of DWIDM's plans. For years they had supported local delegations advocating for embankments to protect their homes and property. Local political leaders had collected cash from them to finance trips to Kathmandu to meet with DWIDM and raise their concerns. Yet when protection finally came, many of the most vulnerable villagers found themselves excluded from a place of protection.

Unsurprisingly, these groups resisted. Daulatpur's embankment, they demanded, must be built on the river's edge. Despite their professed apolitical calculations, DWIDM's engineers could not justify this exclusion. They charted a path closer to the river, but again villagers protested. They had already lost too much land to sacrifice more for the embankment without compensation. Construction was delayed another season. Local leaders implicated in the project from its beginning were forced to make several more trips to the KRTP office in Rajapur, negotiating between DWIDM and marginal landowners who, as one resident said, were ready to, "kill the contractors if and when they returned." The KRTP's path through Daulatpur became so contentious that in 2015, even the Minister of Irrigation, who oversees DWIDM in Kathmandu, came to speak to the community during a surveying expedition.

The results of these political negotiations, however, were rarely conveyed to those directly affected by the decision. In 2016 when I visited Daulatpur, many farmers had heard that construction would begin again in a few months when monsoon ended, but no one knew where the embankment would be built. Potential paths had been surveyed on both sides of them. The project's deferral became a source of anxiety as residents found themselves in a suspended present (Carse and Kneas 2019: 18), wondering if they would ultimately be offered protection, left between the structure and river, or displaced. In this way, Daulatpur's poorest residents were made to live on standby, uncertain what to expect, but prepared to rally when excavators showed up on their land.

In my search for someone who knew the KRTP's route through Daulatpur, I found Raj Kumar, a leader of one of Rajapur's largest political parties. Over tea in 2016, he shared the details of a resolution that Daulatpur's most

marginal farmers, who I had interviewed only days before, knew nothing about. With local protests raging up and down the Karnali, Kumar had arranged an island-wide meeting for political leaders to discuss issues of displacement and land compensation associated with the KRTP. Together, these men agreed to broker a deal with DWIDM, challenging the basis of its claim that embankments must be built 1,500 meters apart. Their plan was to cite the fact that a bridge that had recently been completed across the Karnali's west branch had embankments just 500 meters apart. If the government could build this bridge using the same logic and calculations, then why could Rajapur's embankments not also be constructed this distance from Tikapur's?

After much negotiation, DWIDM's engineers caved to the pressure of local leaders and agreed to construct the embankment directly on the river. In the case of Daulatpur, where 200 households would have been left exposed had DWIDM followed its design requirements, the embankment's new alignment spared both privileged and marginal landowners alike.

"No one knows this yet," Kumar confided to me during his interview. "But the problem has been solved." When asked why the villagers who have most at stake in this decision had not yet been told, however, he laughed. "People will see when the contractors come." In his opinion, it was the responsibility of political leaders to "solve problems" for local people, not to be bothered by disseminating information about the outcome. Yet, it is precisely this act of excluding others from privileged networks of intelligence, a process also documented by Pritchard and Thielemans (2014: 336) in Bihar, India, that allows local political leaders to preserve their power over people by deciding whom to protect and whom to exclude in their facilitation of "solutions."

When asked about the fate of Prem Nagar, for example, a particularly vulnerable cluster of *sukumbāsī* and *mukta kamaiyā* homes perched on Daulatpur's edge, Kumar shrugged: "They have already been given land elsewhere by the government, they just don't want to leave." According to residents, however, only six government-registered *mukta kamaiyā* families had been promised land elsewhere, while the remaining 19 households would be forced to relocate at their own expense if the embankment was built through Prem Nagar. Thus, Kumar and the island's other political elite had supposedly "solved" the problem in Daulatpur by realigning the KRTP to protect their landed constituents while dispossessing only the most

vulnerable, or to use the words of Judith Butler (2004) "socially disposable" members of society: here, the *sukumbāsī*s.

As it became clear that their interests were not being represented by Daulatpur's local leaders, the *mukta kamaiyā*s and *sukumbāsī*s of Prem Nagar joined together in solidarity based on a common history of bondage and dispossession. As squatters on *ailānī* land, the *sukumbāsī*s had no legal right to participate in local meetings let alone launch a protest. The state-recognized *mukta kamaiyā*s, however, had some political leverage to confront DWIDM on both groups' behalf and refused to vacate the riverbank unless Prem Nagar's nineteen *sukumbāsī* families were also relocated.

Ultimately, when work finally began on the embankment two years later in May of 2018, no one was displaced. When I visited Daulatpur's raw embankment a month into construction, Kumar was quick to claim credit for this. "All the *mukta kamaiyā*s and *sukumbāsī*s are now being protected," he explained from the riverbank, watching an excavator plow cobble in the river channel (Image 5). "I was a leader for that. Now everybody supports the KRTP; even the *sukumbāsī*s are happy and busy earning a wage on construction."[10]

While the intervention of political leaders ultimately secured all of Daulatpur's communities, Kumar's role as a champion of the vulnerable is certainly not selfless. Besides the support and potential votes he may win as a political party member advocating for the marginal, he also has personal stakes in where Daulatpur's embankments are placed. As the owner of a significant tract of riverbank land directly adjacent to Prem Nagar, he will benefit greatly if the embankment is built directly on the riverside. Moreover, the KRTP has given him new business ideas and funds from his commissions on construction contracts,[11] to turn them into realities. He tells me, for example, about a riverfront guesthouse he has planned for visitors to nearby BNP.

[10] Contractors are required by DWIDM to hire local residents interested in doing basic tasks like harvesting stones from the riverbed and packing them in crate wire cages at a daily wage of 350–400 Nepali rupees.

[11] In courting infrastructural solutions, Rajapur's political elite position themselves to get a significant cut of the final budget for their patronage. On river training projects in India, after all, it is not uncommon for 60 percent of project funds to be divided within the politician-engineer-contractor nexus (Bharati 1991 cited in Dixit 2009: 64).

Image 5: The site of the embankment in Prem Nagar, actively under construction in June 2018 (Photo by author).

"When the embankment is finished," Kumar states, revealing how he sees his own power over the KRTP and its implementers, "I will tell them to build me stairs down to the river."

Rajipur

Unlike Daulatpur, where the interests of local leaders who owned property along the river aligned with those of the most marginal, Rajipur is a village where the KRTP was planned to be developed almost exclusively on *mukta kamaiyā* land. Here, 30 families at risk of losing nearly half the land granted to them by the government when they were freed from bondage were forced to struggle in isolation against both DWIDM and their more privileged neighbors. Silenced first by contractors who threatened to abandon the entire village to the encroaching river, these households appealed to their local political leader for support. Far from being a champion for their cause, however, this individual tried to coerce the *mukta kamaiyā*s into sacrificing their land.

As a result, people tried advocating for themselves by making trips to the KRTP's local project office in Rajapur and then by lobbying government officials at Bardiya District's headquarters several hours away by bus

in Gulariya. Failing to garner support from officials, however, Rajipur's poor and landless residents living in the island's remote northern reaches determined that this kind advocacy work was unsustainable given the significant resources and time required to commute and lobby at government offices. Therefore, Rajipur's *mukta kamaiyā* community decided to continue their resistance locally through direct action by building temporary shelters at the construction site and refusing to leave their land without compensation.

Threats from their own neighbors and local leaders, however, eventually grew so intense that residents were forced to consent to construction. Long-term contempt from the larger village was not worth their struggle, it was decided, and so all the *mukta kamaiyā* households agreed to submit a letter to DWIDM granting them permission to build on their land.

This self-sacrifice, achieved through both coercion and consent, reflects the complex ways in which marginalized people across Rajapur have been further dispossessed by KRTP and the enactment of structural "solutions" to flooding. Moreover, the isolated struggle of Rajipur's *mukta kamaiyā*s illustrates how the burden of protecting the larger community is borne most heavily by those with the least capacity to resist their dispossession. This pattern extends across Rajapur through the suppression of landless and previously bonded people in other communities.

While none of Rajipur's 30 *mukta kamaiyā* families were ultimately displaced from their homes when the embankment was erected in 2018, as a community they have lost more than three hectares of productive farmland. Although this may sound like a small collective sacrifice to make for structural protection, the fact remains that most *mukta kamaiyā* households own just 0.09 hectares of land that they farm well below subsistence, barely producing a month or two of food to feed their families. While wage labor already must support the remaining year's food and other basic needs, dispossessing marginalized households of what little land and resources they have only exacerbates the vulnerability of Rajipur's most precarious people.

This experience reinforces the fact that whenever a problem like flooding is supposedly "solved"—in Rajipur, in Daulatpur, or anywhere—one must ask, *solved for whom*? After all, as I show in the next section, the dispossession of vulnerable communities by the KRTP is an uneven process of loss that not only occurs in the act of construction, but that extends well into the aftermath of intervention, as those who live most intimately with

infrastructure are also those who often suffer the greatest from its failures, side effects, and disrepair.

Dispossession in the Aftermath of Intervention

While the KRTP attempts to contain and suppress disaster by erecting a material wall between Rajapur Island and the Karnali River, in time, all embankments and the temporary divides they provide either slowly disintegrate or violently breach (Wisner *et al*. 2004; Mishra 2008). Although most of Nepal's embankments have yet to live out their full technical life,[12] the long-term failures and unintended side effects of this development path are obvious downstream in places like Bihar, India where flood protection infrastructure built in the 1950s ultimately took 2.5 times more land *out* of production through waterlogging, sand casting, and breaches than it secured (Gyawali 2011). Similar trends have been documented on rivers across India and Nepal including the Koshi (Mishra 1997, 2008; Sinha 2008; Dixit 2009), Brahamaputra (Baruah 2016; Varma and Mishra 2017), Rapti (Bhusal 2004), and Bagmati Rivers among others (Dixit 2003; D'Souza 2006, 2020; Dixit *et al.* 2007; Singh 2008; Cortesi 2018; Pritchard and Thielemans 2014). Rivers, after all, are meant to move; their floodplains to fill and drain. And Himalayan rivers, in particular, are notoriously difficult to tame, endlessly exceeding structural attempts to contain them.

Less than two years into construction, I returned to Rajapur to find stretches of the KRTP that had never been reinforced with crate wire already eroding and washing sand into adjacent fields. Weakened on the backside by runoff during monsoon, there were also places where the river's current had begun to undercut its gabion reinforcement. Several spurs were already slumping into the river, failing within a matter of a few years. However, as any engineer knows, the more tightly a river is trained, the higher its chances of breaching as the river's load of floodwaters and sediment is consolidated in the narrow space between two embankments (Singh 2008). In Rajapur, where structures are being built half the required distance from each other, disaster feels imminent. If Dixit (2009: 77) is right when he so bluntly states, "embankments are of two types: those that have already breached and those that will breach," then the question in Rajapur is more a matter of *when* and who will suffer the consequences?

[12] For the KRTP, embankments are designed for a technical life of 20–25 years.

In the meantime, as the KRTP continues to erect walls along Rajapur's edges in order to contain floods, these embankments both interrupt natural hydrologic processes and prevent people from accessing the river. This situation has produced a whole new set of small, but chronic "everyday disasters" (van Voorst *et al.* 2015), that plague residents in the KRTP's wake. For example, since embankments are designed to create an impermeable barrier between the land and river in order to prevent flooding, they also inevitably restrict drainage. During monsoon, water puddles against embankments and can sometimes stand stagnant for months, ruining crops and molding the walls of people's homes. Thus, rather than suffering from occasional inundation, people are now forced to *live* with floods, elevating their beds on stacked bricks or suspending them from rafters in order to sleep. On days the kitchen is too wet to cook, they eat dry food.

In this way, embankments enact multiple barriers. They divide and recode the landscape (Cortesi 2018), interrupting the fluid movements not only of water, but also of people and animals between the land and the river (Image 6). Like the rain which can no longer drain after an embankment is erected, people too cannot access the river, as they have to climb up and down a wall of lose, cascading stone. Elderly people, in particular, describe having difficulty getting over the structures and women complain about having to carry water to their livestock since the embankment blocks their path to the river. Similar challenges have been documented in marginalized communities living in the shadow of embankments across India by D'Souza (2006, 2020); Singh (2008); Sinha (2008); Baruah (2016); Cortesi (2018); and others (Pritchard and Thielemans 2014; Varma and Mishra 2017). As in Rajapur, they find that in the name of preventing one disaster, others are created.

Small, chronic disasters of the everyday produced by infrastructure make life harder: rocks roll into yards, rain washes sand into fields, mosquitos breed in waterlogged areas, and people no longer feel a breeze off the river. Thus, long after dispossessing Rajapur's most marginalized people based on the fragile illusion that flood control is even possible, the island's embankments go on enacting their own erosive and quotidian forms of violence against those who live along their bases. In some cases, it is those farmers who encouraged the realignment of embankments to protect their marginal lands and who even suppressed the protests of their less privileged neighbors in the process, who now end up suffering directly from their side effects.

Image 6: A partially completed embankment built to protect this community on their land has also created everyday challenges for them including waterlogging in their fields, erosion of stone and sand that washes into their yards, and difficulties in accessing the road and river (Photo by author).

Many marginal farmers continue to pay taxes on land at the bottom of the river, under new embankments, and for reclaimed fields that remain submerged. They do so, hoping that one day the river will shift and their land will drain. In this way, even those who win protection initially in the positioning and erecting of infrastructure do so unevenly and are not guaranteed this advantage forever. The security that they "win" is precarious and often erodes quickly as the agency of nature, with its flows of sediment and water, slam into Rajapur's human-made walls.

In this way, the winners and losers of structural solutions to disaster are not only determined at the time of construction as people struggle to control where an embankment is built and who gets displaced, but also as negative side effects emerge in the wake of construction. While the KRTP may provide basic short-term protection and mitigate some of the island's worst bank cutting for both marginal farmers and landed elite, it essentially "mortgages the future" of some of Rajapur's most vulnerable residents for a fragile and temporary security (Mishra 1997: 2212). Moreover, this form of protection is distributed unevenly and erodes in time. Without a formal

plan or fund to maintain its infrastructure, DWIDM essentially abandons the structures it erects in communities that have no capacity to maintain them. As is the case in most of South Asia, Rajapur's embankments will be left to age until they eventually become a greater risk to the people living there than a source of protection. "Even with these embankments," one woman reflects during an interview in 2016, turning around to look at the structure looming behind her home, "life here is not secure."

Conclusion

This article has argued that floods in Rajapur were never crises *by nature*, but rather *became* crises through a gradual process of dispossession that began long before the KRTP and that was later intensified through the application of river training. The institutionalization of private property, the enclosure of forests as national parks and buffer zones, and the government resettlement of bonded laborers have each contributed to shaping local vulnerabilities. Over time, the nature of floods and people's relationships to them changed as Rajapur's most precarious residents increasingly faced disasters exacerbated by development patterns and infrastructure, at the same time that they were structurally dispossessed of alternative ways of living with the Karnali River. This process ended up fixing command-and-control infrastructure as seemingly the only way to cope with the island's chronic and worsening effects of inundation.

However, rather than relieving the precarity of Rajapur's most marginalized populations, the application of river training works through the KRTP has actually had the effect of both further dispossessing and exposing the island's most marginalized communities to new and more pervasive forms of disaster like chronic waterlogging and sandcasting. Meanwhile, the Karnali's floods are discursively framed by DWIDM as *natural* disasters independent of, rather than entangled with their surroundings. They are imagined to be both predicted and contained through scientific calculations and large-scale infrastructure. However, as I have argued, in their attempt to contain disaster by suppressing the Karnali's floods, Rajapur's embankments have had the effect of producing new "hydro-hazardscapes" (Mustafa 2013), land and waterscapes in which humans have contested and realigned social, political, and environmental factors to produce the lived reality of hazardous places. The embarkments have dispossessed Rajapur's most marginalized peoples of their subsistence base and have left many others,

only slightly better off, living alongside precarious infrastructure. This violent redistribution of vulnerability begins with political struggles during construction and continues as biophysical processes become entangled with and exacerbated by the materiality of rock and gabion walls. Vulnerability is redistributed not only at the time of an embankment's construction and through the political struggles that precede it, but also by nature's own response to infrastructure.

Until the Karnali River is given back some of its power to ebb and flow with the seasons and a more sensitive and just system of intervention is created, its victims will continue to live, not only with floods, but with the politics and material effects of their so-called "solutions," to paraphrase Mishra (2001: 2761). This reality is especially true for the most marginal who over time have been left with fewer and fewer options. Nonetheless, struggles are certain to continue on the banks of the Karnali River so long as the promise of infrastructure (Appel, Anand and Gupta 2018) and the hope of a more secure future is present, serving some and failing others in patterns predictable perhaps but still the subject of a fluid politics.

Scholars of political ecology have long argued that disasters are social, that vulnerability is uneven, and that environmental management is political (Wisner *et al.* 2004; Peet, Robbins and Watts 2011; Robbins 2011). Informed by these broader theoretical arguments, this article has added a nuanced account of how vulnerability is a fluid and temporally dynamic condition that can be intensified and entrenched through intra-community politics that surround structural "solutions" to disaster. In my analysis of local struggles to control the position of the KRTP and mitigate its effects of dispossession, I have shown how even those who initially "win" protection from embankments are not necessarily guaranteed safety from floods in the long-term. Protection is not permanent. Security is not ensured. While an embankment may initially protect one's property from inundation, in the course of just a few years that very structure may begin to fail or produce new risks by interrupting something as basic as the flow of rain to the river.

In this way, whether one wins or loses as structural "solutions" to flooding are erected in a place like Rajapur, is a question that is not only determined at the site of construction and in the moment of implementation through an uneven process of dispossession and protection. It is also a question determined by time as structures are built and then abandoned to serve and fail some more than others. These findings on slow-onset dispossession

exacerbated by embankments in Rajapur, combined with recent ethnographic work of Cortesi (2018) and Baruah (2016), suggest an agenda for Nepal geographies to examine how vulnerability can be entrenched and exacerbated over time as structures erode and fail certain people and places more than others. The case of Rajapur exemplifies why it is so critical to examine how vulnerability can be induced not only through social and political struggles at the time structural "solutions" to disaster are erected, but also by the material ways in which this infrastructure reconfigures people's relationship with nature in the long-term.

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