



Research, part of a Special Feature on [Everyday Adaptations to Climate Change](#)

Salt in the wound: embodied everyday adaptations to salinity intrusion in the Sundarbans

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ABSTRACT. The relationship between everyday lives and the climate changed present is layered, complex, and deeply embedded in social context. In the Sundarban region of India and Bangladesh, the entangled web of development, anthropogenic climate change, and so-called climate change adaptation projects (such as concrete embankments, the hardening of coastlines, and brackish aquaculture) have interrupted natural adaptation processes and caused environmental degradation that negatively impacts those who live there. Scholars have called for better frameworks to link between everyday struggles and macro-level processes of climate change and development. Building on a long-term ethnographic engagement and existing theories of everyday adaptations to climate change, I utilize salinity intrusion as a case study showcasing the complicated interlinkages of climate change and development on daily life. I argue that there are three interlinked processes of increases and accumulations of salt: naturally occurring, exacerbated by capitalism and development, and exacerbated by climate change. Residents describe the consequences of salinity intrusion as they materialize in their bodies, evidence of the external imposition on their lives. I argue that although climate change is the cause of environmental transformation, it interacts with local conditions in diffuse ways that social science needs to pay attention to. Looking at the causes and consequences of salinity intrusion in tandem allows us to see past hegemonic thought and makes way for understanding climate adaptation outside of the constraints of neoliberal development paradigms.

Key Words: *adaptation; everyday; salinity intrusion; Sundarbans*

INTRODUCTION

In Bangla, it is often said that your fate is written on your forehead at birth, *kopale lekha ache*. This phrase is commonly employed by my friends and interlocutors in the Sundarbans region of India and Bangladesh, suggesting that the happenstance of their living in a village riddled with salt was predetermined. Salinity intrusion is experienced intimately, within their bodies, foods, health, and sanity. The relationship between humans and the changing climate is layered and complex. On one hand, Sundarbans residents are experiencing environmental harms, such as salinity intrusion, coastal erosion, increased storms, higher and hungrier tides, irregular seasons, and embankment breakages. But they are also experiencing a parallel intrusion of development and governance structures coming in to help them with the effects of climate change or, equally as often, using the concept of climate change as a guise for projects and agendas that have long been underway (Dewan 2021, Falzon 2021a, Paprocki 2021). Although many of my interlocutors look within themselves to understand the harmful increase in salt, scholarship shows that the increase in salinity is the unwanted residue of environmental changes and capitalist development.

In this paper I utilize salinity intrusion as a case of the complicated interlinkages of climate change and development on daily life. I seek to understand what kinds of causal arguments everyday, local understandings allow us to theorize and how these theorizations help us broaden our understanding of climate change adaptation beyond the confines of neoliberal development paradigms. I argue that there are three interlinked processes of increases and accumulations of salt: naturally occurring, exacerbated by capitalist development, and exacerbated by climate change. I lay out a detailed analysis of how salinity intrusion functions and is maintained in the region and I discuss the theoretical grounding for this paper, which builds on existing literature of the everyday to destabilize current understandings of adaptation. I argue that

attention to everyday embodied changes challenges hegemonic thought and makes way for understanding climate adaptation outside of neoliberal development paradigms.

CONTEXT

The roots of salinity intrusion in the Sundarbans

Salinity intrusion is an environmental harm in the Sundarbans that accretes in three interconnected ways. First, some salinity intrusion in the region is a natural byproduct of the Sundarbans being a deltaic region with both salty and fresh waters. Second, some salinity intrusion functions as a form of pollution, i.e., the excess of a capitalist system that has adverse effects on marginalized people (Latour 2007, Auyero 2009, Anand 2017). This category began with Western colonialism and directly resulted in the massive expansion of aquaculture (Islam 2014), the hardening of coastlines (da Cunha 2018), and massive disruptions to the Sundarbans' natural processes (Iqbal 2010). The legacies of colonialism persists today as neoliberal development projects continue to shape the region (Hossain 2017). And third, climate change, moderated through sea level rise, changing temperatures, increased extreme weather, and ocean acidification, is dramatically increasing how much of this type of salinity intrusion exists. On the ground, while the impacts of salinity intrusion are felt cumulatively, it is important to pull apart the contributing causal factors.

The natural environment is a protagonist in the history and development of this region, often disrupting the social and political fabric (Guhathakurta and van Schendel 2013). Three Himalayan rivers carry a huge sediment load through India and Bangladesh to the Bay of Bengal, creating a very dynamic landscape: the Bengal delta. Nestled inside this delta, the Sundarbans mangrove forest is accustomed to rapid changes and is therefore quite resilient to climate change. Annually, over one

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billion tons of sediments are carried down and dispersed throughout the region (Guhathakurta and van Schendel 2013). The monsoons, river systems, wetlands, mangroves, and chars are acclimatized to shifting siltation, migrating islands, and rapid regrowth (Bhattacharyya 2018, da Cunha 2018). Even the mangrove trees that the forest is known for have adapted to increased salinity and expel salt from their leaves (Azad et al. 2022). As with any powerful ecological force, the ecology of the Bengal Delta has tremendous social implications on those who live there.

Western intervention, especially British colonialism, created enormous changes that interrupted natural and regional flows of siltation and water. The British government deemed the Sundarbans as “needing to be improved” which led to widespread deforestation (Kingsbury 2018). Records of salinity intrusion and the local governments asking foreign aid for salinity issues dates back to the late 1800s (Henderson 1920). Worsening the problem, Western control of the region via both colonialism and development has deemed rivers and floods as “dangerous” and in need of being controlled (D’Souza 2006, Lahiri-Dutt and Samanta 2013). As a result, colonial cartography created conceptual hard lines that separate land from water (Mathur 2017, da Cunha 2018). These hard lines both on maps and people’s understandings were mirrored infrastructurally by the high, concrete, embankments, and confining of rivers, dams, etc. The legacies of these Western ideologies persist both within the development complex and in upper-class Bengali mindsets that strive for Western resemblance (van der Veer 2001, Hossain 2017).

Because of increased storms and the changes in regional siltation and water flows, concrete embankments break routinely, causing saltwater intrusion, coastal erosion, and reduced crop yields. Interventions such as these hardened concrete embankments are called flood-protective infrastructures and passed off as climate change adaptation, but rather they should be seen as interruptions to natural long-standing flood-protective systems. Traditionally Sundarban residents have used a lighter touch and maintain low earthen embankments around inhabited lands. Around agricultural lands, they make and break embankments seasonally to allow fresh monsoon rains to wash away salt and pollution, leaving behind fertile agricultural lands. Whereas, the concretization of the embankments simultaneously keeps some saline water out, yet also traps salinity inside of inhabited lands. Although concrete embankments are helpful for keeping water out during cyclones, they have also been widely criticized because, like sea walls, inevitably one day they will not be tall enough and in the interim create a false sense of security. In the Sundarbans, local residents who are proponents of these walls place so much hope on them that they often build concrete houses right at the base of them believing that these Western infrastructures are fail proof. In recent years, there have been many local protests against these new hardened embankments for increasing salinity, trapping polluted waters, and corruption within construction.

Because of the loss of agricultural lands from the hardening of coastlines, the expansion of aquaculture, and concrete embankments that keep the land salty, the residents of Sundarbans have lost many traditional forms of work, such as fishing and agriculture (Ahmed 2018). The shrimp and crab aquaculture industry is known for creating, maintaining, and profiting from salinity intrusion (Guhathakurta 2008, Adnan

2013, Paprocki and Cons 2014). Both products are marketed for export, while the region they are extracted from struggles with food insecurity. The expansion of this harmful economy is also marked by an enclosure of the freshwater canal commons. Many of my interlocutors say that public canals have been often co-opted into private shrimp fields, rendering even more fresh water salty. The shrimp and crab industries have not only made the inhabited lands more salty, they have permeated the development complex and promote their harmful industry as a way of bringing new “sustainable” livelihoods to a climate-stricken place (Ahmed et al. 2022). Instead, these projects use the struggling residents of the Sundarbans as cheap labor for a massive capitalist project and simultaneously exacerbate the salinity issues in the region.

Because of anthropogenic climate change these processes are unfolding at an unprecedented rate. There has been an increase in extreme weather, like cyclones, which dumps large amounts of salty water inland in their wake. For instance, 2009 Cyclone Aila was one of the worst storms to hit the region (Mukhopadhyay 2016). However, it was also used to justify more concrete embankments and further the expansion of aquaculture. Because of this, many of my interlocutors, who have witnessed many subsequent storms, still use Aila as a landmark of change in their lives. Sea level rise is another direct reason for the increase in salinity in the region, it leads to more coastal erosion, dying mangrove trees, and broken or breached embankments that leave behind a long lasting salty residue on the affected lands. Finally, there is a negative feedback loop between coastal erosion, the breaking of embankments, sea level rise, mangrove deforestation, and increased salinity. As climate change persists, this feedback loop will worsen and make the everyday lives of Sundarban residents even more difficult.

THEORETICAL BACKGROUND

Climate change adaptation decisions are made mainly by global professional experts while local vulnerable communities have limited input and live within the constraints of the decisions (Falzon 2021a). On top of that, experts from “developed”⁽¹⁾ nations dominate global climate discussions, further drowning out the voices of vulnerable people from places like the Sundarbans (Falzon 2021b). As a result, climate vulnerable communities are systemically dispossessed and displaced resulting from imposed top-down projects that reify capitalist values (Paprocki 2021). Top-down project-based thinking renders what people are doing and how they are adapting in the everyday invisible (Castro and Sen 2022). In this paper I theorize with everyday voices to shift the center of power to the local level from institutional interventions. Individual shifts have the ability to contest authority, subjectivity, and knowledge and in this case are being used to understand adaptation outside of the confines of the neoliberal development paradigm.

There is a call for scholarship that better bridges the gap between the actual struggles and relations between households, communities, and powerful state and corporate agents (Peet et al. 2010, Dewan 2021). It is impossible to make a claim that everyday individual behaviors are directly connected to climate change because the pathway between them is complicated by other variables. The fallacy of making these direct, causal claims is what anthropologist Camelia Dewan refers to as “climate reductive translations,” i.e., reducing and shifting causality from climate change in a way that occludes other major variables at play such

as the harmful effects of development projects, governance issues, natural systems, etc., or more simply put, adding language about climate change to projects already underway that have nothing really to do with climate change. To correct for these reductions, everyday adaptation is a method of attuning to the hyperlocal changes that are being made by people experiencing a wide array of daily environmental harms and how these changes aggregate (Castro and Sen 2022). They draw out the distinctions between material and discursive climate change. Although everyday behaviors cannot be reduced and attributed directly to climate change, within them they hold important information about how realities of both climate change and the intermediary variables are being experienced. I argue that although climate change is the cause of environmental transformation, it interacts with local conditions in diffuse ways that social science needs to pay attention to.

There is a long tradition of scholarship that teaches us how to do this; it looks at what everyday lived realities can elucidate about social contexts (Hartmann and Boyce 2013, Ahmad 2017). Similarly to everyday adaptations, embodied understandings have been used by many scholars to connect individuals to society at large (Federici 2004, Fraser and Greco 2004, Mies 2014, Bladow and Ladino 2018). A subset of this literature thinks about conceptions of bodies and environment, showing that embodied emotions, in part, constitute lived experiences of nature-social relations (Sultana 2011), that there is a type of intimate objectivity that allows only people from a place to understand and be reflexive about it (Jue 2017), and that understanding lived experiences with moral coded substances can offer insights into the ecologically damaged world, reflect social hierarchies and behavioral changes (Pathak 2020). The body is not inextricably separated from the surroundings but rather constantly interacting with and part of their surroundings (Ingold 2012). Building on theories of embodiment and adaptation, I use the body to address the challenge of linking the everyday, climate change, and development and answering the call to connect households, communities, to states and corporate agents.

METHODS

Data collection

Following eight months of preliminary research between 2018 and 2020, I returned to the Sundarbans in September of 2021, where I spent the next 14 months conducting research for my dissertation. My goal was not simply to skim the surface and do a few interviews with local people, I wanted the deepest possible understanding of everyday life and how it is changing. To attain this level of understanding, I had to immerse myself in two villages, one on each side of the Indian-Bangladeshi border where I developed deep relationships of closeness and trust. Both villages I have chosen are relatively close to the border; analytically this means that the environmental change experienced by the villages is comparable. My selected villages are also bordered by the uninhabited forest, separated from the forest by a river or just a few kilometers. Because of this proximity, these villages are the closest to the Bay of Bengal, the forefront of man-animal conflict, the most salinated, and the places where the ecological changes are felt the most acutely. My Bangladeshi village is also one with the highest level of foreign intervention because of its aforementioned positionality.

I have observed the Sundarbans through four successive cyclones (Fani, Bulbul, Amphan, Yaas) and now the global Covid-19 pandemic. Over the past six years, I have tracked life events, changes, decision-making patterns, and everyday adaptations of more than 40 Sundarbans families. To account for the interruption of my fieldwork due to the COVID 19 pandemic, I conducted check-ins over the phone. Finally, throughout my time in the region I have visited nearby villages, towns, and cities, and conducted interviews and created collaborative networks with scholars, development professionals, and others who work in the region. This engagement as a whole has shaped this paper and my understanding of the region.

Ethnography is a tremendously personal and embodied methodology. I am deeply cognizant of the challenges and pitfalls of ethnographic research, especially in terms of claiming completeness of understanding social phenomena (de la Cadena 2015, Small and Calarco 2022). I strive to share the ideas of my interlocutors while also knowing that there is substantial variation within the ethnographic field. My interactions with my interlocutors are not neutral. I know that my American citizenship, being part of the Bengali diaspora, high caste, physical features, gender, preconceptions, and other facets of my identity wholly shape my experiences in the field and also facilitate my access to the field. In this paper, almost all of the data I present are from my female interlocutors. I attribute this to the intimacy of salinity being far easier to talk about “between us women.” Many of the sections I outline below, namely issues with mental health, skin, hands, and the stomach deeply affect men as well. I did hear about the impacts of salinity intrusion from men, but often with less detail and openness.

RESULTS

“The salt is everywhere ... in the forest, the land, the ponds. It is in my food, in my clothes, on my body, and in my health. Living here, living in this salty place ... yeah, it causes me suffering, but what to do? It is written on my forehead.” Luna di, a 50-year-old woman living in the Indian Sundarbans, has shared this and similar sentiments with me regularly for the past six years that I have known her. Sometimes she will laugh about not needing to add salt to her food because washing the dishes in salty pond water means that the food will salt itself. Sometimes she will share about her *koshto*, her discomforts, from the salt. When she shares about her life’s problems, the antagonist of the story usually stays the same: salt.

Below, I move over the human body exploring the ways that salinity intrusion affects daily life.

Hair

After a few days of washing my own hair in the salty Sundarban pond water of the NGO housing that I often stay in the Indian Sundarbans, a strange headache set in. I felt as if grains of salt had embedded themselves into every hair follicle on my head, tugging just enough to be extremely irritating without being painful (field notes, July 2018). To my dismay, this type of headache was the norm for women in the Sundarbans. When I asked them about it, they said “yes, our scalps have become spoiled,” insinuating that the salt has irreversibly penetrated their hair follicles, rotted them, and caused copious hair loss. To remedy this, they add more oil than usual to their hair, in hopes that greasing the battlefield will force the salt particle intruders to slide

out. Coconut oil, I have found, is suggested as a preventative measure for many of the ways salt intrudes on the body. However, sometimes the excess oil actually draws in more particles of dust, dander, and dirt to the hair. All together the oil and the flecks of nature increase the weight of one's head and hair in a way that, at least for me, made my balance slightly unwieldy.

Mental health

My interlocutors often mention that they are sick with salt in terms of their mental health. They often mention that they or others are more hotheaded or that the salt is making them go crazy. Mental health or any matters regarding the head in the Sundarbans is often not considered as real. When a research assistant of mine was in a car accident and described concussion symptoms, headache, dizziness, and feeling sluggish, I attempted to explain a concussion and what you should do about it. He replied that it sounded like something that people with too much time on their hands made up and proceeded about his day like normal. Many of my interlocutors say they feel as though the salinity has intruded into their bodies, lives, and is eroding away their sanity. Meela di, a 40-year-old mother of 6 in Bangladesh, sighs at the end of her interview and says "Water is life and I suffer with water, what to do?" There is a growing body of literature that supports these claims; the work connects climate changes' both direct and indirect effects with inducing mental stress, connecting loss of livelihoods with mental illness, alcohol and drug use, and suicidal ideation (Chowdhury et al. 2008, Kabir 2018, Hossain et al. 2021), and disasters with post-traumatic stress disorder (Chowdhury et al. 2008, Hayward and Ayeb-Karlsson 2021). For people living in salty conditions in the Sundarbans, working to adjust their mentality toward their new surroundings is an arduous constant task. The trouble is that the fabric of their lives does still resemble what they once had, and yet, in many ways living in the Sundarbans is an entirely different experience than it once was.

Roni apa, a 35-year-old mother of 3 in Bangladesh, thinks of mental health as real but does not know of anyone in her community that would agree. Roni apa went to college in Khulna, a nearby urban area and attributes her different understandings to her time in the city. When sharing with me, she looked relieved to be able to say things out loud. As we walked she pointed at the trees, the embankment, the sun, the river, and said "These are the things that remind me that I am stuck here and stuck with all of this salt. It affects every part of my life. It really wouldn't be so bad here if it wasn't for all the salt everywhere." Roni apa, over the years, has tried more ways of changing her life than anyone else I know: trying for a government job, elevated garden, educating her daughters closer to the city, trying to work with local NGOs, raising different types of animals to see which was the most profitable. Apa often says she is tormented by remembering her life in the city and knowing what life could be. "This pain is something else. Some people have physical pain and some have mind problems. I have a mind problem, and I know about my problem, I understand my problem, I even know how to solve this, but I can't. I am stuck and that's another pain. ... Even worse, I can't tell anyone this, I can't tell anyone about my pain."

Skin

Scars and rashes are commonly seen on the bodies of people who live and work in the Sundarbans. Although these marks are not usually caused by the salt they are certainly worsened by it. The difficult and physical labor typical of the area keeps people out in the hot, salty air and injuries are commonplace because of the nature of their work. These wounds become permanently etched into their skin as they bathe in saltwater; it erodes scabs and leaves permanent marks behind. Even the unscarred portions of skin become so rough over time from being sanded daily by salt. The reduced fresh water supply has been found to increase skin and eye diseases (Rahman 2008). Today, remnants of scarring from disasters is not unusual to spot on Sundarban bodies. Another common skin symptom worsened by increased salinity is heat rashes. The harsh summer sun and particles of salt work together to block one's pores. The increase in scars and rashes are often used, by my interlocutors, as evidence of how life in the Sundarbans was less directly at odds with nature before.

Hands

My interlocutors conveyed that the new and increasing salt in the mud changed the way their homes dried, creating a type of sticky muddy labor that is involved with constantly cleaning and repairing their home each day. They added that the additional rain and more unpredictable timing of the monsoons in recent years, made it so their homes were perpetually damp for good portions of the year. Sakina, a 25-year-old woman who lives on government lands in Bangladesh after her home was destroyed during Aila explains that, "Our house is as wet as water during the monsoon." Many of the recent cyclones have occurred during the summer, and families have had to rebuild their homes during an inopportune time with highly salinated mud. They stated that their homes never really dried because of this. As an alternative, many people are saving, getting loans, or help from the government to opt to build brick homes. Others, like Luna di and her family, maintain that there is something morally better about the traditional mud homes and take on the adaptation labor of making it work long term.

Stomach

The connection between Sundarban locals and their land is unmistakably marked in their attachment to the traditional fish and vegetables. The increased salt on the land and in the water changes and continually fluctuates how food tastes, is grown, and cooked. Many people talk about the changes to the food and refer to the changes in flavor as impure and corrupted (for more see Dewan's 2021 theorization of *bhejal*). With less variety of crops and fish available and more options with lower nutritional values, there is decreased food security and increased malnutrition (Khan et al. 2011, Rabbani et al. 2012). The absence of traditional crops and fish demoralizes residents. Fish are a huge part of the cultural identity for Bengalis. One of the first losses that my interlocutor, Nisha, 25, from India mentioned during Cyclone Aila was that, "all my fish died and those types of sweet water fish can no longer survive in my pond." She continued to explain that with all the changes to the food, the fish, and the land, "home no longer felt like home." Dietarily, many villagers often eat non-traditional but exorbitant amounts of shrimp or baby shrimp as their protein source because they simply cannot afford larger fish as prices have skyrocketed based on limited availability. Nisha's family chooses

not to eat bigger shrimp despite it being their preference because they would rather have the money they would make from selling it. Prawns and larger shrimp have always been one of many sources of protein in the Sundarbans, but small and baby shrimp have now become a dietary ubiquity.

Hips and legs

Sundarban homes almost always are nestled up against a small man-made pond. These ponds are essential for daily life. The traditional functions of the pond include providing drinking water, water for bathing, water used for the bathroom, a place to raise freshwater fish, doing laundry, and washing dishes. As these ponds have become salinated, locals have had to find new access to fresh water (Quazi 2006, Abedin et al. 2014) and there is not an adequate supply of groundwater to tap into (Islam et al. 2010). In some villages, people end up traveling up to 5–10 km round trip to access fresh water almost daily. Depending on the village and what their water table looks like some community members may have a tube well drilled in their own homes to access groundwater that they often share with neighbors. In India, commonly, each village has a few time calls: a fresh water tap where local people can access fresh water usually twice a day that is piped in from other water sources. Most families augment walking to tube wells and time calls with rainwater catchments. Though rainwater is effective for helping reduce sodium (salt) intake through drinking water, it still has negative impacts because it does not have many vital minerals previously contained in Sundarbans water (Shammi et al. 2019). Every family makes its own decisions, but for the most part in heavily salinated villages because of the work of carrying it home each day, the fresh water is reserved for drinking. Therefore, washing dishes, clothes, bathing, etc., all take place in salty waters. When Meela di was telling me about her walks for water, she said she travels an “hour each day to get water, [and it is still] a little bit salty.”

For the most part, fetching water is seen as household labor and therefore women mostly take on this job. Supia, 27, from Bangladesh, explained that “[fresh] water is very far from here. 25 or 30 minutes distance. I go by walking but many people go and bring them by cycle. Usually I can just go once but on hot days I have to go at least twice.” Other women of Supia’s village recounted tales of drilling an 8-foot tube well with the hopes of finding sweet water and still finding salt water. They talked about how crushing it is to live in a place that used to have opportunities and resources but is now ruined by salt. They use a mixed-system of walking to fetch water and rain catchments. When their rain catchments run low, the women have to walk almost two miles to get water. Some do not have childcare, so they hold their child in one hand and their water drum in the other. Some people have given up on the daily struggle for water and either allot money to buy water or drink salt water with chlorine pills to kill off the possible diseases. Varsha, 34, mentioned that “During the monsoon it is hard to collect water. ... Sometimes I fall on the slippery roads while collecting the water.” When my interlocutors go on these walks for water, they carry the water in a large 12-liter silver vessel on their hips. The muscles in their hips, overtime, have settled in a way that gives the vessel a stand to settle on. When children accompany their mothers on these walks, they take a two-liter water bottle and practice the same motions with less weight. Their hips act as evidence of the new and changed routes they take every day to fetch water for their families, salinity intrusion that one can feel externally on their bodies.

Uterus

The increased regional salinity and expansion of aquaculture intimately affects women’s gynecological health. One common job for women working in the shrimp fields is wading into the waist-deep murky waters and reshuffling the algae from the ponds into towers emerging like stalagmites from the water bodies. Another common job among these women is catching baby shrimps along the river banks, which entails pulling a long net while waist deep in brackish waters. Saline water and often chemicals intrude directly into women’s bodies during shrimp work. Many women report health problems from this type of work, including urinary/reproductive tract infections, excessive bleeding, yeast infections, pelvic inflammatory disease, and many undiagnosed forms of pain “down there.” They also mentioned, frequently, how terrible it is to do this type of work during their periods because it causes even more painful infections. These infections are persistent and when I myself got one likely simply from proximity to these waters I had to take four rounds of intense, expensive antibiotics to rid myself of it. Medical care for these conditions is expensive, and mostly out of reach, and sometimes does not help anyway. When I told my interlocutors about my infection, they suggested coconut oil as a preventative measure. But they said, once you have it, you will always have it. Luna di has had this sort of pain since childbirth and her son is now 18. And Meela di, who does this work, described that “it is as if the salt is intruding into her.”

Roni apa shared that “It’s so much harder to have a baby now than it used to be. The moms are not as strong and it goes bad much faster. We often have to send them to Shyamnagar [the nearest town] to have a baby and only some of them come back and some of them do not.” Many women are told that they need to get a hysterectomy on account of how much salt water has entered into their uterus. Medical research confirms these findings and shows that pregnant women are heavily affected by salinity in terms of difficult pregnancies, the births of disabled children (Khan et al. 2011, Kabir et al. 2016), and salinated drinking water increases the risk for preeclampsia, hypertension, and infant mortality (Shammi et al. 2019). In Bengali culture, the ability to have children is intensely valued. This emotional and embodied loss is unquantifiable.

DISCUSSION

I laid out deeply personal and intimate experiences with salinity intrusion. Residents describe environmental changes as they materialize in their bodies, evidence of the external imposition on their lives. Everyday adaptations include new ways of living with salt: extended and daily walks to fetch water, new approaches to health and mental health, not putting salt in food because it is already there, increased time spent fixing their homes and embankments, applying coconut oil, and reliance on new systems of agriculture and, subsequently, of livelihoods. These embodied accounts of everyday life elucidate how socio-environmental inequalities are lived. The changing climate is experienced as a tremendous material loss (Elliott 2018), ranging from the loss of peace and traditional fish and crops, to the ability to bear children. The confluence of climate change and development in the region is rewriting the social context and norms, amplifying fears of flooding to build concrete berms, replacing lost jobs with new ones that maintain the salt, etc. After understanding the head-to-toe discomforts caused by salinity intrusion, it is no longer possible to think of concrete embankments or brackish aquaculture simply as positive changes to the region.

Everyday adaptations of local people paint a very different picture than the ones put forth by many global experts of climate change and development. On the ground, salt is understood as a primary vehicle for environmental changes. Therefore, looking at the causes and consequences of salinity intrusion in tandem allows us to see past hegemonic thought and makes way for understanding climate adaptation outside of the constraints of neoliberal development paradigms. We can see how although natural systems may have been enough to regulate natural salinity intrusion, the long colonial history of deforestation, hardening of coastlines, and changes to the flows of citation and water in the Sundarbans and throughout the entire Bengal region has interrupted these systems. Aquaculture and concrete embankments worsen the problem by maintaining salinity, profiting off of it, and profiting off of the cheap labor of Sundarban residents (Ahmed et al. 2022). All of which cumulatively has deep and intimate effects on daily life in the Sundarbans.

Moving beyond adaptation as a climate reductive translation

Current development and governance policies address the impacts of climate change from the top down. “Experts,” mainly from the Western world, propose development ideas and solutions to be implemented in places like the Sundarbans. These ideas usually benefit those who concocted them more so than those affected, but are still coded as climate protection. For instance, in the Sundarbans shrimp and crab aquaculture projects are brought in under the guise of “sustainable livelihoods.” This is a climate reductive translation (Dewan 2021) that obscures both the relationship between local people and these new jobs and the fact that the aquaculture will worsen and maintain the region’s salinity, as we have seen in the preceding section. Dewan’s work puts a name to the problem that this paper is working toward solving. Making claims about climate change happening from the top down occludes many of the other causal variables. I suggest, instead, to look from the bottom up and expansively understand how development, climate change, and natural processes are interlinking to form the lived experience. Therefore, individual accounts of the lived realities of environmental harms constitute an important dimension of adaptation to climate change and development.

I assert that a method to avoid climate reductive translations, like what adaptation has become, is to instead be climate expansive by starting from the bottom up and cumulatively studying the effects of capitalist development, climate change, and climate change adaptation projects, which, this paper has aimed to be an example of how to do. Although everyday behaviors cannot be reduced and attributed directly to climate change, they should be at the center of adaptation conversations because within them is important information about how realities of both climate change and all of the intermediary variables are being experienced. These embodied, local understandings allow for critical distinctions between material and discursive climate change.

CONCLUSION

Salinity intrusion is not a problem only written on the foreheads of those who live in the Sundarbans but rather is a problem that is already beginning to batter coastlines worldwide. The three interlinked processes of increases and accumulations of salt—naturally occurring, exacerbated by capitalism and development,

and exacerbated by climate change—are not limited only to the Sundarbans by any means. Nor is the hardening of coastlines, bringing in “sustainable” livelihoods, and other climate reductive translations. The 2019 IPCC report indicates that “Risk related to Sea Level Rise (including erosion, flooding, and salinization) is expected to significantly increase by the end of this century along all low-lying coasts in the absence of major additional adaptation efforts” (IPCC 2019:324). This suggests that if neoliberal development paradigms about climate change persist unchallenged, we could see the same climate reductive policies from the Sundarbans upscaled throughout the world. These policies are a threat to hindering local level adaptation and natural adaptation processes.

Defining adaptation not only as large-scale foreign-funded projects but also as these localized daily changes in ways of living and relating to the world skews the center of power. These hyperlocal changes acknowledge the ability of individual shifts to contest authority, subjectivity, and knowledge. Adaptation as it stands is deeply enmeshed in neoliberal capitalism, which as we know is how we got to the level of environmental degradation that we currently have. By rethinking adaptation outside of the constraints of neoliberalism, we can move out of the ways of thinking that got us here in the first place. And instead of centering Western “experts,” our adaptation experts can be Luna di, Meela di, Nisha, Supia, Varsha, and Roni apa and we can center the voices and ways of living of everyday people making the everyday difficult decisions about how to rearrange their lives in a rapidly changing climate. With voices like these at the center, it is impossible to argue that aquaculture and embankments are steps toward a just climate future. Instead these voices open the possibilities for what a just climate future could be.

[1] I follow Ferguson’s (1990) example in putting “developed” and “developing” countries in quotation marks to indicate the socially constructed and problematic nature of these terms.

Acknowledgments:

First and foremost, I am deeply grateful to my interlocutors for their time and generosity. I thank Nikhil Anand for nurturing this paper from its inception and reading numerous versions of it. I thank Danielle Falzon, Gopa Mukherjee, Christina Lu, and Pablo Aguilera Del Castillo who have spent countless hours thinking with me through the many iterations of this paper. I thank Briana Castro with whom I coined the term everyday adaptation. I also thank EnviroLab (Amanda McMillan Lequieu, Pooja Nayak, Rebecca Winkler, Indivar Jonnalagadda, Jeanne Lieberman, and Adwaita Banerjee), my writing group (Ashleigh Cartwright, Hannah Olson, Ellen Bryer, and Nick Graetz), and Rabani Garg, for their comments on earlier versions of this paper. I thank the organizers of the SDI Adaptation workshop, Cristy Watkins, Arun Agrawal, James Erbaugh, Maria Carmen Lemos, Chuan Liao, Ben Orlove, and Jesse Ribot, for bringing about this special issue. And finally I thank the editors, Craig Allen and Becca Nixon, and anonymous reviewers whose careful attention helped shape the paper through the publication process. This research was made possible by funding

support from the Center for Advanced Study of India, the Gertrude and Otto Pollak Research Fellowship, the Fulbright-Nehru Student Research Fellowship, and Teece Research Fellowship Award. This work would not have been possible without the engagements and collaborations with the International Center for Climate Change and Development, Jadavpur University, and South Asia Forum for the Environment.

Data Availability:

The data/code that support the findings of this study are available on request from the corresponding author, RS. None of the data/code are publicly available because they contain information that could compromise the privacy of research participants as stipulated in their IRB approval. Ethical approval for this research study was granted by University of Pennsylvania approval number: #829983.

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