

“Big Prawn’s” Little Pawns:  
Environmental Injustice in Bangladeshi Shrimping Aquaculture  
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Global demand for animal-source proteins has surged in concert with world population growth and rising incomes (Hilborn et al., 2018). Consumption of shrimp has dramatically increased in Western nations in the past several decades, fueling a lucrative shrimping industry in the Global South in coastal Asian countries like Bangladesh, India, and Thailand (Brototi, 2017). According to the United Nations Food and Agriculture Organization, shrimp is the world’s second most valuable seafood, after salmon (Shrimp Synopsis Report, 2015). In Bangladesh, tiger shrimp and their relatives have entered the cultural lexicon as “white gold” due to their high export value. The country’s southwest coastline and warm climate are ideal for shrimp aquaculture and prawn farming is currently one of the largest sectors of the national economy (Ahmed et al., 2017). But as the price of shrimp plummets in Western supermarkets, the rural poor of producer countries like Bangladesh bear the burden of the profit margin. The price tag on a bag of our favorite frozen prawn cannot capture the full socio-environmental cost of the animal’s cultivation and export. Equal parts ecosystem member and commodity good, shrimp satiate the appetite of the Global North at the expense of the environment and adjacent communities in the Global South. In this paper, I will examine environmental injustice in Bangladeshi prawn farming, from farmer to food system, within the framework of global capitalism and political ecology.

Environmental injustices at the scale of the individual Bangladeshi include land dispossession, food insecurity, pollution of drinking water, poor working conditions, and impacts

on health and education (Smash & Grab, 2003). The country's most productive resources are its warm, wet coastlands, access to which sustains poor rural communities. Shrimp aquaculture requires large salinized ponds and pumping infrastructure; consequently, cropland traditionally used for rice and vegetable farming is repossessed, often forcibly, and inundated with saline water. As of 2003, an estimated 120,000 farmers in the Satkhira region alone endured land seizures due directly or indirectly to shrimp farming. Communities dispossessed of coastal and estuarine resources are vulnerable to increased poverty and food insecurity (Smash & Grab, 2003).

Shrimp pond salinity can leach into nearby freshwater supplies and destabilize soil composition, devastating the crop productivity and health of adjacent rural farming communities. Soil salinization results in poor crop yields and, in extreme cases, infertile farmland. For example, in Satkhira, rice yields declined from 40,000 tons in 1976 to 360 tons in 1986 due to salt encroachment from shrimp farm canals (Smash & Grab, 2003). The environmental degradation of formerly productive farmlands is a cyclical trap; left with no other options, impoverished rural farmers may sell their fields at deflated prices to the same aquaculture operators responsible for inundating their croplands with salt (Islam et al., 2003). As I will discuss later, this systematic means of land dispossession buttresses neoliberal ideology.

Salinization's adverse health effects are spotlighted through a feminist political ecology (FPE) perspective. As Truelove explains, FPE recognizes inequalities on the scale of the body and household, especially as they relate to the feminization of space and labor. These inequalities are linked to larger practices of access to resources such as water and sanitation (Truelove, 2011). Shrimp farming is especially harmful to the livelihoods of women and children. As water

tables are salinized and polluted by pesticides, antibiotics, and disinfectants used in prawn ponds, communities lose access to safe drinking water. One account describes the salinization of groundwater pumped by hand from tube-wells in the coastal village of Salabunia. Villagers relied on reservoir ponds for rainwater storage to make it through the dry season, but after 2009's Cyclone Aila destroyed shrimp canal embankments, the pond water was rendered undrinkable by salt inundation. Women are the traditional collectors of potable water. In some villages, due to salinized well-water, women must walk 5-6 km daily to find clean sources (Smash & Grab, 2003). Children are frequently recruited to help gather water, or, as households are stressed by reduced agricultural productivity, work on shrimp farms. A 1998 study by the UK foundation Save the Children reported that more youth are illegally employed in the shrimp industry than in any other in Bangladesh (Smash & Grab, 2003). Child laborers earn wages as low as \$0.45-1.10 per day and forgo school attendance in order to help their families. Moreover, children are burdened with water-borne diseases. In one instance, following the conversion of mangroves to shrimp ponds near Sonadia, Bangladesh, locals reported an alarming uptick of insect-borne disease (Islam et al., 2003).

Women and young girls are disproportionately affected by sexual harassment and violence in the shrimping industry. While rural women traditionally perform household-based agricultural activities like threshing, processing and storing produce, feeding and grazing livestock, and cooking and cleaning meals, shrimp farming has drawn females into new roles on shrimp depots, processing plants, and as collectors in saline ponds. Their transition into labor dominated by male superiors has been marked by sexual intimidation. In Katahali, a village in the Bagerhat district, 30 women were reported kidnapped and 150 reported rape in 1993 alone

(Smash & Grab, 2003). The enervation of women's well-being is one of the most egregious social costs of Bangladeshi shrimp farming.

Coastland conversion for intensive shrimp farming requires the transmogrification of an entire ecosystem. Mangrove forests permeate Bangladeshi intertidal zones; the carbon-rich trees play host to a litany of marine life. The country is home to Sundarban, the world's largest mangrove forest and a UNESCO World Heritage site. This critical habitat is a nursing ground for hundreds of species of fish, shellfish, and crustaceans of value to subsistence harvesters (Ahmed et al., 2017). Additionally, mangrove forests are vital refuges for endangered river dolphins and crocodiles (Murky Waters, 2012). Due to a variety of ecosystem services, some reports suggest that the livelihoods of over 3.5 million Bangladeshi are directly or indirectly dependent on mangrove forests (Ahmed et al., 2017). Their destruction has implications for local food security, livelihood, and global carbon emissions. Shrimp farming is responsible for up to 38% of global mangrove forest loss; in Bangladesh, over 10,000 hectares of mangrove loss is attributed to the practice (Ahmed et al., 2017). In a poignant example of ecological devastation, small-scale fishermen in the Bangladeshi village of Chokoria reported 80% declines in fish catches after mangrove destruction and dike construction for shrimp farming (Smash & Grab, 2003). Mangrove forests provide the indispensable ecosystem service of shoreline stability; their destruction engenders the inundation of coastal communities. In 1991, thousands died when a tidal wave overtook a coastal area swamped by shrimp farms. The same area was razed in 1960 by a wave of comparable magnitude, but mangrove forests had absorbed its force and mitigated damage (Ahmed et al., 2017).

Hardy et al.'s 2017 investigation of "racial coastal formation" contributes to the discourse on mangrove forest destruction. As the authors argue, environmental disasters related to coastal inundations are influenced by socio-ecological formations of coastal regions (Hardy et al., 2017). On the Bangladeshi coastline, poor communities are left vulnerable to environmental hazards like tidal wave inundations due to the destruction of formerly protective ecosystems. Oftentimes, inhabitants of flood-prone areas are reliant on prawn farming for income. As a result, the practice of shrimp-seedling catching and prawn rearing is indispensable to those who are most vulnerable to the consequences of mangrove forest destruction.

Where the forests are not damaged, the ecosystem is imperiled by the harvesting of wild shrimp larvae, which are used to stock the ponds of commercial aquaculture. A report by the Swedish Society for Nature Conservation estimates that for every larva caught, an average of fifty juvenile fish die in the fine-mesh nets (Murky Waters, 2012). This practice results in the decimation of fish stocks on which subsistence fishermen and endangered species rely.

The conversion of natural ecosystems into shrimp farms exemplifies the concentration of an open-access resource into a private, single-user one, sometimes termed the "tragedy of enclosures" in the parlance of urban political ecology (Truelove, 2011). In Bangladesh, the enclosure of mangrove ecosystems disrupts their constituent elements, as both local communities and endemic animals are endangered by habitat loss. Land values decrease by approximately \$10,000 per hectare when mangroves are cleared for shrimp culture (Ahmed et al., 2017). This fact calls into question the state-sanctioned enclosure of valuable native ecology in favor of

export-oriented shrimping. Lucrative short-term profits may attract commercial shrimpers, but the long-term value of the ecosystem will degrade without sustainable management.

Historical-political processes lend context to the ecology of shrimp aquaculture (Amazu, 2018). On the scale of the food system, global market forces operate to reinforce injustices to individual Bangladeshi farmers. Global neoliberal ideology holds that market dynamics of consumer demand in the Global North result in increased production in the Global South. The shrimp industry is the second largest export industry in Bangladesh, worth US \$506 million in 2016 (Al-Amin & Alam, 2016). Total operational farming areas have increased in size from 3,500 hectares in the 1980s to 276,000 hectares in 2010. The shrimp sector is a significant component of the nation's rural economy, reportedly employing over two million farmers on-site and in associated value chains (Ahmed et al., 2016).

A political ecology (PE) perspective deconstructs the politicization of ecological systems in terms of power structures and environmental decision-making (Amazu et al., 2018). In Paul Robbins' *Political Ecology*, one functional definition of PE is the "study of the complex relations between nature and society through a careful analysis of what one might call the forms of access and control over resources and their implications for environmental health and sustainable livelihoods" (Robbins, 2004, p. 16). An application of PE with respect to Bangladeshi shrimp aquaculture dissects the social relations of production, property, and power in the context of the global agro-food system. According to a report in the *Journal of Rural Studies*, themes in political ecology include global value chains, "aquarian" transitions, primitive accumulation, gendered labor, and food sovereignty (Belton, 2016). A thorough study of access and control to shrimp is necessary to apply Robbins' definition of political ecology. In Bangladesh, access and

control to the resource of shrimp is not neutral, as revealed by historical analysis. In the 1980s, the World Bank, the International Monetary Fund, and other donor agencies imposed structural adjustment programs (SAPs) to incentivize export-oriented economic decisions (Adnan et al., 2007). These reforms were intended to enhance the productivity of “under-developed” countries through an economic system based on free-market values of privatization, deregulation, and liberalization. In order to obtain World Bank loans and assistance, Bangladesh was required to adopt the SAP model (Aminuzzaman et al., 1994). The World Bank and the United Nations Development Programme (UNDP) funded Bangladesh’s Shrimp Culture Project in 1986 and the Third Fishing Project in 1991 (Brototi et al., 2016). Pulido (2017) points to programs like these as the basis for a “neoliberalized racist state” in which the dynamics of global capitalism enable land appropriation, privatization or “enclosure,” and state-sanctioned violence. In this way, Western neoliberal policy induced the Bangladesh government to displace rice farmers in favor of high-value shrimp ponds (Belton et al., 2016). With significant foreign backing, state powers systematically dispossessed peasants of land and enclosed these ecosystems for export production in an iniquitous example of primitive accumulation. The transition from rice paddy-dominated subsistence agriculture and mangrove fishing to commercial aquaculture is an example of neoliberal globalization.

On the heels of rising demand from consumers in the US, Japan, and Europe, wealthy domestic interest groups lobbied the government for prioritization in the allotment of shrimping lands. Their influence prompted the 1992 *Chingri Mahal* (“Shrimp Zone Rules”), which rescinded de jure prioritization of poor peasants in state land allotment. Under the new code, the state turned a blind eye to the illegal use of force and manipulation of land records by wealthy

interest groups (Adnan et al., 2007). In some cases, the state was actively involved in fraudulent land-grabbing. Armed exponents of political leaders used sluice gates in deltaic regions to flood cropland, forcing rural landowners and fishers out and creating saline pools for shrimp aquaculture (Greyl, 2016). As communities systematically lost access to traditional food production, their self-sufficiency declined and their dependence on the market for survival increased. As described previously, salinized soil induced many farmers to sell their holdings to shrimp operators. One Salabunia villager reported that “[before shrimp farming] we always had rice in stock so there was no tension” (Belton, 2016, p. 46) Another Salabunia villager remarked that “[prior to the advent of shrimp aquaculture] we could produce everything, but now we have to buy every single thing” (Belton, 2016, pg. 46). Bangladeshi people who lost access to land altogether joined the aquaculture industry as laborers. This transition is culturally problematic as laborers are accorded much lower social status than farmers (Belton, 2016). Work on shrimp farms consists primarily of dike maintenance, pond guarding, and weed clearing. But as men increasingly migrate from their villages to find other labor, women perform low-level work on shrimp aquaculture operations. Statistics reveal the feminization of shrimping labor: 73% of depot workers and 65% of process plant laborers are women (Islam et al., 2003). While shrimp culture has opened up new avenues of employment for rural women, Truelove argues that “feminine” labor is often devalued. Indeed, women employed in shrimp aquaculture in Salabunia averaged a daily wage of just \$0.91 (Belton, 2016).

In addition to food sovereignty and dispossession issues, transmutation of paddy to aquaculture heralded a shift from sharecropping agreements to lease contracts. Many rural farmers lack the capital to pay the advance deposits of land lease contracts. Accordingly, a power



hierarchy undergirds the ecology of shrimp farming and disadvantages small-scale farmers; hamstrung by poor financial resources and lack of state support, they are heavily indebted to middlemen and off-takers. Pulido writes that “differences in value become critical in the accumulation of surplus—both profits and power,” and “human difference” is central to this process (Pulido, 2017, p. 4). The severe inequality between rural farmers and creditors/debtors enshrine the capitalist accumulation to which Pulido refers. Shrimp contributes substantially to the Bangladeshi national economy via export value, but the gains of large farmers and traders with foreign connections have been achieved at the expense of small-scale, marginalized fisher/farmer communities and mangrove ecosystems. Profits migrate to stakeholders outside of shrimp farms—an estimated 75% of industry investors in coastal Khulna and Satkhira are foreigners—while peasants work for low wages (Smash & Grab, 2003). The influx of foreign capital associated with shrimp aquaculture very minimally trickles down to the communities who need it most.

If global capitalism saddled the Bangladeshi rural poor with the costs of the Global North’s heady appetite for shrimp, the industry’s regulation should be the providence of the state. Pulido argues that the state is invested in *not* solving human inequalities in capitalist systems because it would be costly and disruptive to industry (Pulido, 2017). As described previously, IMF and World Bank structural adjustment projects enabled land-grabbing by armed state representatives and local political leaders (Greyl, 2016). Additionally, the aforementioned *Chingri Mahal* included 10% tax breaks and discounts in infrastructure development and electricity for shrimp exporters (Shrimp Synopsis Report, 2015). These breaks for big business run contrary to the state’s official “Fisheries Policy,” which theoretically guides shrimp industry

operation. Two of its official objectives are to “increase employment to eradicate poverty and development of the socio-economic situation of the fisherfolk” and to “maintain the ecological balance, protect biological diversity, and develop health” (Shrimp Synopsis Report, 2015, p. 7). But state action has disadvantaged fisherfolk and destroyed biological diversity. The Fisheries Policy is a state “performance” of regulatory activity without producing meaningful change (Pulido, 2017).

The state is also culpable in violent oppositional suppression, choosing to intimidate protestors rather than indemnify displaced farmers (Al-Amin et al., 2016). From 1980 to 2003, over 150 people lost their lives in violence related to shrimp farming (Smash & Grab, 2003). In 1990, local activist Karunamoyee Sardar was shot in the Khulna district while leading a protest movement against a local “shrimp boss” who was attempting to open up the village to shrimp aquaculture (Brototi et al., 2016). In 1999, poor peasants sued a different shrimp boss in the Char Dhaner Shish River region after a shrimp pond system waterlogged their cropland. In reprisal, thugs attacked and burned the homesteads of the plaintiffs (Adnan et al., 2007). Three years later, in August of 2002, prominent Bangladeshi politician Alamgir Farid was explicitly implicated in the destruction of mangrove forests for shrimp monoculture (Smash & Grab, 2003). The intimidation, and, as in Sardar’s case, eradication of opposition is clear evidence of “state-sanctioned violence” in favor of capital accumulation. Pulido argues for a conceptualization of the state as fraudulent in its support of racial capitalism and willingness to forsake endangered communities (Pulido, 2016). Indeed, systematic Bangladeshi state-sanctioned land-grabbing, intimidation of the opposition, and lack of support for poor

farmers ballast the export-oriented shrimp industry. The state has granted legal impunity to global capitalism.

Intensification of shrimp farming in coastal Bangladesh endures as a federal priority despite the salient human and environmental hazards. In 2015, the Bangladesh Department of Fisheries and the Food and Agriculture Organization of the United Nations unveiled a \$38 million development project to increase the saline water availability for shrimp aquaculture in the Khulna, Satkhira, Bagerhat, and Bazar regions (Greyl, 2016). As of 2015, the average annual growth rate of shrimp production in the nation was 5.38%, indicating the industry's perpetuated predominance (Ahmed et al., 2017).

Shrimp is but one constituent of a global food system with externalities unknown or ignored by the average consumer. We are complicit in environmental injustice when we purchase food from the supermarket because the global food industry actively cloaks injustice in cheap price tags. The environmental impact of shrimp can be considered from perspectives such as inputs (energy, freshwater, labor), consequences (greenhouse-gas emissions, land-use change, habitat degradation), and, as emphasized by an environmental justice approach, human impact (land dispossession, health violations) (Hilborn et al., 2018). The nebulosity of the environmental impacts of shrimp farming necessitates a multi-scalar, dynamic investigation. The state has operated in consonance with the global neoliberal agenda and reified a system of land dispossession and innumerable human rights violations. The nascent shrimp industry of the 1980s was touted by development agencies as an answer to Bangladesh's poverty and unemployment, but the economic benefits of the industry have accrued in the hands of wealthy operators while rural communities bear the brunt of the costs. If Bangladesh is to rely on shrimp

farming as a substantial part of its economy in perpetuity, the state must regulate the industry to protect and benefit vulnerable communities. One solution might be sharecropping arrangements for shrimp ponds, which would allow farmers with limited capital to lease small shrimp aquaculture operations (Belton et al., 2016). Mangrove reforestation would improve biodiversity and enable the diversification of seafood exports, should the state government invest in sustainable fishing methods. Though the feminization of shrimp farming in the present form devalues women's labor, there is opportunity for empowerment. If women are provided a fair income unattached to male earnings, then they will have more influence in household decision-making. Finally, there is evidence to suggest that diversified or integrated farming is a sustainable alternative to shrimp monoculture. In one Bangladeshi village, Bilpabla, farmers rotated production of shrimp with rice, vegetables, and small fish as opposed to year-round shrimp cultivation. The result was higher levels of food sovereignty as households generated both subsistence and a marketable surplus of diverse crops, high local wages, and equitable land allotment through healthy rental markets (Belton et al., 2016). To revisit the political ecology perspective, political decisions regarding shrimp aquaculture implementation and regulation have exploited and thereby perpetuated inequalities. Bilateral agencies like the World Bank and Asian Development Bank funded the rapid and poorly-regulated expansion of the shrimp farming industry, and now donor agencies have an incentive to provide financial and technical assistance in a just, humane manner. Aid requires a foundational shift to indemnify the ecosystems it has traditionally sacrificed; this may include mangrove forest restoration, long-term social benefit programs, robust stakeholder analysis, and penalties for bad actors.

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