



Critical environmental justice and the nature of the firm

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Abstract

The critical environmental justice (CEJ) framework contends that inequalities are sustained through intersecting social categories, multi-scalarity, the perceived expendability of marginalized populations, and state-vested power. While this approach offers new pathways for environmental justice research, it overlooks the role of firms, suggesting a departure from long-standing political-economic theories, such as the treadmill of production (ToP), which elevate the importance of producers. In focusing on firms, we ask: how do firms operationalize diverse social forces to produce environmental injustice? What organizational logics sustain these inequalities? To understand the firm-level dynamics shaping treadmill acceleration and environmental injustice, we utilize two concepts—*social embeddedness* and *managerial authority*—from economic sociology research on firms. The former refers to the social and non-economic factors that guide economic decision-making, whereas the latter refers to the power that reinforces worksite hierarchies. This theoretical paper argues that social embeddedness and managerial authority interact within firms to produce an organizational logic that sustains environmental injustice and ecological disorganization. We draw from historical and contemporary evidence on sugarcane plantations in Latin America and the Caribbean, with cases ranging from the colonial period to the present day. By bringing economic sociological concepts to bear on the CEJ and ToP frameworks, we advance debates on how firm-level dynamics shape environmental inequalities.

Keywords Critical environmental justice · Treadmill of production · Firms · Social embeddedness · Managerial authority · Plantations

Environmental justice (EJ) scholars recently expanded the boundaries traditionally defining the field on two fronts. First, whereas earlier generation scholarship focused on one or two social categories, newer research is interested in studying the myriad forces intersecting to produce injustice (Bell et al. 2019; Clark et al. 2018; Ducre 2018; Hoover 2018; Malin and Ryder 2018). Second, departing from the long-standing EJ view that the state is a potential avenue for achieving justice in impacted communities or through policy-making venues, scholars increasingly take a critical

stance toward the state. For example, recent research theorizes that the state obstructs justice by sanctioning environmental harms to buttress economic growth, preserve unequal hierarchies, and defend polluter interests (Ashwood and MacTavish 2016; Harrison 2019; Kurtz 2009; Pulido 2017). Synthesizing these new viewpoints, the Critical Environmental Justice (CEJ) framework has been advanced to interrogate the interdependent and diverse social forces creating and sustaining environmental inequalities (Pellow 2017). The framework rests on four pillars: (1) intersecting social categories, including race, class, gender, sexuality, and species, (2) multi-scalarity regarding space and temporality, (3) perceived expendability of marginalized populations, and (4) state power that reproduces the social inequalities inherent to capitalism.

While this emergent research offers new pathways, it currently undertheorizes the role of firms, a notable absence for three reasons. First, among environmental social scientists, producers are of long-standing importance for studying the social forces that propel ecological disorganization (Rudel et al. 2011). In the treadmill of production (ToP) theory,

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large businesses that extract resources, generate pollution, and exacerbate inequalities are the center of the political economy, with their interests dominating economy, state, and society (Schnaiberg 1980; Schnaiberg and Gould 1994). Second, there has been scant research focused on the myriad forces that shape firm behavior in treadmill processes, with ToP research often emphasizing capital, labor, class, and technological relations. However, recent scholarship shows that race, gender, sexuality, and community identity also play key roles in the treadmill's acceleration (Bell 2016; Bell and York 2010; Carrillo 2020a; Dockstader and Bell 2019). Lastly, while EJ scholars are increasingly interested in using organizational approaches to study the entities that defend inequalities, this research largely emphasizes government institutions and neglects private companies (Harrison 2019; Pulido 2017). There is thus a need to better understand the role of producers through a CEJ lens.

This article therefore asks: how do firms operationalize diverse social forces to produce environmental injustice? What organizational logics sustain these inequalities? To answer these questions, we use insights from economic sociology on firms to bridge the ToP and CEJ approaches. Economic sociologists have long studied how social structure shapes the organizational behavior and economic actions of firms (Burt 2004; Freeland 1996; Granovetter 1985, 2005, 2017; Mizruchi 1996; Uzzi 1997). To understand the firm-level dynamics that shape treadmill acceleration and environmental injustice, we utilize the concepts *social embeddedness* and *managerial authority*. The former refers to the social and non-economic factors that guide economic decision-making, whereas the latter refers to the power that reinforces worksite hierarchies. In this theoretical paper, we argue that social embeddedness and managerial authority interact within firms to produce an organizational logic that creates and sustains environmental injustice and ecological disorganization. To develop this claim, we draw from historical and contemporary research on sugarcane plantations in Latin America and the Caribbean, with cases ranging from the colonial period to the present day. This paper aims to deepen our grasp of the important role of firms in producing environmental injustices, and we do so by linking key insights from environmental sociology and economic sociology.

Critical environmental justice and the firm

In studying the forces, structures, and ideologies that reproduce injustices, the CEJ framework rests on four pillars. The first is intersectionality, the idea that multiple forms of oppression, related to race, class, gender, sexuality, and species, interact to reproduce inequality. Second, injustice operates through multi-scalarity, with temporal

and spatial processes reinforcing domination. The third is perceived expendability, the notion that some groups are more dispensable than others. Fourth, state power buttresses oppression by using legal and institutional mechanisms to sanction unequal treatment (Pellow 2017).

This framework builds on recent EJ research demonstrating the importance of diverse social categories, such as gender, community identity, and sexuality (Bell 2016; Dockstader and Bell 2019), which uphold inequality. These studies diverge from long-standing EJ research focusing on one or two social categories, such as race and class, and thus seek to understand how intersecting forces shape inequality. Others increasingly take a critical view of the state, departing from the conventional EJ stance that the best prospects for justice lie in using democratic means to compel state enforcement. Rather, leading researchers recently argue the state is likely to defend polluter interests due to industry capture, racial ideology, or utilitarian logic (Ashwood 2018; Ashwood and MacTavish 2016; Harrison 2019; Pulido 2017). Much of this scholarship similarly argues that the broader capitalist system is inherently anti-ecological and anti-democratic because it relies on continuous resource extraction from ecosystems and requires invidious hierarchies to maintain its basic functions (Holleman 2018).

This wave of EJ research opens up new lines of critical inquiry, yet tends to overlook the firm's role in favor of the state, leaving under-examined the firm-level dynamics that reproduce injustices. This neglect of the firm likely derives from the idea that betrayal of the public interest is to be expected from firms, but not from democratic government. However, it is useful to also turn a critical lens toward firms. As much of the scholarship on firms and pollution relies on aggregate data on toxic emissions and sector-level behavior, little is known about how authority and social structures *within* firms propel ecological disorganization. Looking within firms allows an understanding of how diverse forces shape organizational behavior and why firms appeal to the state for legal and institutional protections.

In focusing on producers, this article responds to recent calls to use intersectional and organizational approaches to study environmental inequalities. EJ scholars recently stressed the importance of studying how multiple social categories interact to provide a fuller accounting of injustices (Buckingham and Kulcur 2010; Clark et al. 2018; Holifield et al. 2010; Malin and Ryder 2018; Walker 2010). While Harrison (2019) and Pulido (2017) focus on organizations that reproduce disparities, they emphasize state institutions rather than private firms. Furthermore, Freudenburg (2006) points to the crucial role of specific firms in producing unusually high volumes of pollution, underscoring the utility of interrogating how sectors, organizations, and forms of decision-making facilitate variable environmental impacts.

Treadmill of production and the nature of the firm

The ToP is perhaps the leading framework within environmental sociology explaining the political-economic forces that drive ecological disorganization. The ToP considers large firms the nucleus of the political economy, as they shape public policy and societal aspirations. For Rudel et al. (2011, p. 224), the core ToP thesis is “that under the guide of capitalists who seek at all times to maximize their profits, individual firms produce as if on a treadmill, running ever faster to stay still, while spewing out an unending stream of goods and environmental externalities.” Producers use a twofold strategy to broker their political-economic power. As the main financer of government and campaigns, they steer laws and policies toward their self-interests. As large employers, producers use the threat of job loss and decreasing tax revenues to discipline politicians, workers, and voters. These mechanisms ensure the institutionalization of industry-friendly regulations, as multiple constituencies see their interests in line with producers (Gould et al. 1996; Schnaiberg 1980; Schnaiberg and Gould 1994).

Despite the firm’s centrality to the political economy, few scholars (for exceptions, see Downey 2015; Grant et al. 2010; Perrow and Pulver 2015; Pulver 2007; Sapinski 2019) use organizational approaches to study how the internal dynamics of firms shape treadmill processes. In contrast, economic sociologists have long examined the firm to understand the motivations and structures that guide economic action. Much of this inquiry stems from Coase’s (1937) foundational article, “The Nature of the Firm,” which asked why firms exist. This question challenged the classical viewpoint that the price mechanism was the economy’s central coordinating force. Under this stance, entities resembling firms should not exist in competitive markets, since price signals alone would guide individual responses to supply and demand (Gibbons 1999; Granovetter 1995). Coase countered that firms exist to manage key transaction costs, such as risk and information, and to impose internal order through employment relations, functions that the price mechanism is incapable of capturing and signaling.

Although Coase demonstrated that firms play a meso-level role mitigating micro- and macro-level forces, his interpretation was purely economicistic and under-socialized. Sociologists, in turn, sought to elucidate how social forces shape the economic actions of firms. For Macneil (1978, p. 901), the firm is “a minisociety with a vast array of norms beyond the norms centered on exchange and its immediate processes.” While this literature is extensive, our analysis focuses on two features of the firm—social

embeddedness and managerial authority—that are also vital for understanding the linkages between the ToP and CEJ frameworks.

While classical theory presented the figure of *homo economicus*, an ‘economic man’ whose individualized cost–benefit calculations guided actions, the meso-level study of social embeddedness challenged notions of social atomization, asserting that economic and non-economic sentiments are intertwined (Granovetter 1985; Granovetter and Swedberg 2011). Non-economic factors include “cultural, political, religious, and broadly institutional influences,” which shape principles related to trust, power, norms, and values (Granovetter 2017, p. 15). These factors are central to social embeddedness, which operates along three dimensions within the firm. First, relational embeddedness refers to the relations that exist between two people. The economic actions resulting from this dyadic exchange depend on each individual’s identity and the mutual expectations that comprise the relationship, such as the internalized class identities that guide interactions between a worker and supervisor. Second, structural embeddedness refers to “the overall structure of the network that individuals are embedded in” (Granovetter 2017, p. 18). Relationships are nested in a wider network of individuals through which trust, norms, and power are transmitted and reinforced, shaping the economic actions of firms and individuals (Uzzi 1999; Uzzi and Lancaster 2003). Lastly, temporal embeddedness refers to the accumulation of historical relations that influence current relationships, as legacies of past interactions become nested in expectations, emotions, and routines (Granovetter 2005). Scholars of racial capitalism similarly argue that racial ideologies are central to and operate through these forms of social embeddedness in particular and through capitalism more generally. Race and ideas about racial difference shape the nature of relationships between economic actors, the networks in which they function, and reflect historical dynamics that inflect those relationships and networks. More specifically, racial ideologies shape work routines, social control, and segregated life opportunities (Gilmore 2007; James [1963] 1989; Rodney 1981).

Managerial authority acts alongside social embeddedness to influence a firm’s organizational behavior. State institutions are central to managerial authority, as the legal definition of employment creates the structural conditions in which labor relations operate (Coase 1937; Williamson 1975). A core task of managerial authority is to impose obedience and loyalty, which is achieved through the institutionalization of legal standards favorable to firm interests. These legal rights allow firms to exist “as a domain characterized by unique rights, obligations, role structures, and identities” and governed by the principle of “close control...characterized as the right to exercise control over the employees’ time, methods of work, and physical conduct while carrying

out their job" (Freeland 2009, p. 198). Managers also impose authority by setting the firm's organizational structure, thereby determining divisions of labor, spatial relations, and habituated tasks (Burt 2004; Freeland 1996, 2009).

Conferring legal power upon managers to control firm hierarchies aids in the legitimization of social norms and practices, translating into what March and Olsen (2011) call the logic of appropriateness: "The appropriateness of rules includes both cognitive and normative components" with "rules followed because they are seen as natural, rightful, expected, and legitimate. Actors seek to fulfill the obligations encapsulated in a role, an identity, a membership in a political community or group, and the ethos, practices, and expectations of its institutions." The effects of managerial authority on the logic of appropriateness are threefold. First, once workers imbibe such norms, they are incorporated into expectations of appropriate behavior workers emulate. Second, rules comprise a shared vocabulary among those who populate a firm, thus coordinating behavior, attitudes, and practices. Finally, with rules ingrained over time, they are considered natural and normal, which strengthens their legitimacy and eliminates alternative behavioral options from emerging (Freeland 2009).

March and Olsen's insights are supported by Steven Lukes's theory of power. For Lukes (2005, p. 28), the "logic of appropriateness" in an organizational setting reflects "the most invasive and insidious form of power" because the subjects of that power tend to comply and remain quiescent in the face of domination. This exercise and expression of power is concerning for Lukes because it supports a view of unchangeable inequality. Polluting corporations similarly reproduce their own power by embedding self-serving ideologies in laws and discourses (Brulle 2019).

These economic sociological claims on embeddedness and power extend from Polanyi (2001), who critiqued self-regulating markets and saw the importance of market-environment interactions. For Polanyi, self-regulation requires turning land, labor, and money—referring to ecosystems, humans, and capital—into fictitious commodities subordinated to market demands. Such unfettered marketization would eventually degrade the environmental and social foundations on which healthy societies thrive because this process fails to prioritize the wellbeing of communities and ecosystems. Further, Polanyi saw that political-economic elites would always wield state power, selectively intervening to strengthen market logic by weakening labor and environmental protections. Polanyi therefore challenged market utopianism ruled by prices and individual freedom, showing how market embeddedness in state, society and nature shapes prospects for human and ecosystem flourishing.

The social structure of treadmill processes has rarely been studied within the firm. Social embeddedness and managerial authority are useful for understanding the diverse social

forces that guide organizational behavior and logic toward ecological disorganization. Advancing this inquiry responds to calls for the deeper study of how ideology and institutions interact to sustain inequality (Bell and York 2010; Golash-Boza 2016; Hirschman and Garbes 2019; Hughey et al. 2015; Ray 2019; Wingfield 2020; Wingfield and Alston 2014) and how bias operates at an intersectional level within organizations (Collins 2000; Roscigno 2007; Stainback and Tomaskovic-Devey 2012).

Critical environmental justice on plantations

We argue that social embeddedness and managerial authority interact within firms to produce an organizational logic that creates and sustains environmental injustice and ecological disorganization. We draw from case study research on sugarcane plantations in Latin America and the Caribbean to support this claim, and use these cases to illuminate how key aspects of plantation operations correspond with the tenets of the CEJ framework. Our sources include a range of secondary literature from leading scholars and key writings that provide fine-grained analyses of social, economic, and environmental relations on plantations. Some works are considered classics of their genre, while others are highly cited in the modern field of environmental history.

The plantation is an ideal firm type for this study. First, unlike other firms where environmental relations are less visible, the centrality of monoculture on plantations allows a clearer delineation of environmental and non-environmental dimensions. Second, the plantation as a model of extractivist and violent agriculture and social organization has been so widespread for centuries across so many continents that the term *plantationocene* alternatively labels the Anthropocene epoch (Haraway 2015). Third, the plantation's simple organizational structure, with clear socio-environmental inequalities, divisions of labor, and power dynamics, concisely reveal how daily activities and organizational behavior interact over time. Lastly, systems of patriarchy, racism, and authoritarianism operate openly on plantations. While these pernicious forces continue to shape injustices more covertly (Carrillo 2020a), studying their explicit form allows for clearer theory-building.

In Latin America and the Caribbean, sugarcane plantations have been central to the political economy from the colonial era to the present day. Plantation lords, who considered the racialized and gendered hierarchies of plantations to be morally ideal, embedded such organizational principles across other social spheres (Holanda 1936). In generating lucrative exports, plantations supported colonial administrations and local elites while bankrolling European monarchies and industrialization (Galeano 1973). Slave traders in the British empire's Caribbean sugar plantations during the

Table 1 CEJ pillars and firm-level dynamics

CEJ pillars	Firm-level dynamics
Intersectionality	
Multi-scalarity	Social embeddedness
Expendability	
State-vested power	Managerial authority

eighteenth century described slavery as “the hinge on which all the trade of this globe moves” and as “the foundation of our commerce...and first cause of our national industry and riches” (Hochschild 2006, pp. 13–14, 54–55). European powers amplified their imperial ambitions in Latin America and the Caribbean, as the diet of their industrializing societies became dependent on sugar (Mintz 1986). Plantation interests continue to shape politics, such as modern-day Brazil, where agribusiness leaders have weakened labor and environmental protections (Schwarcz 2019). Plantations have thus long played an important organizing function in local and transnational relations.

Treadmill processes are inherent to the organizational behavior of plantations. An orientation to economic growth shapes plantation responses to market pressures, public policy manipulation, and human and natural resource management. Since plantations impact ecosystems with growing magnitude, they conform to the conventional ToP model. For instance, the world’s largest sugarmill, Brazil’s São Martinho, began as a small plantation in 1948 and now controls 135,000 hectares and annually produces 24 million tons of sugarcane (São Martinho 2018). Political-economic forces shaped this expansion, as the Brazilian state responded to global shocks in sugar and oil prices with subsidies, protections, and other interventions that underwrote the consolidation of land, labor, and capital necessary for mill growth (Ramos 1999). Moreover, plantation owners tend to have outsized political-economic influence, enjoying greater access to and power over policymakers, the workforce, and consumers (Rodney 1981). The transformation of plantations into mills therefore involves an intensifying feedback loop of extracting and polluting land, water, air, and labor.

The diverse forces delineated in the CEJ framework operate within plantations to shape ecological disorganization and environmental injustice. Social embeddedness and managerial authority are key mechanisms through which these forces are sustained on plantations. As Table 1 outlines, we analyze three of the CEJ pillars—intersectionality, multi-scalarity, and expendability—through the prism of social embeddedness, whereas we use managerial authority to study the fourth CEJ pillar—state-vested power. These mechanisms function in distinct yet overlapping ways, so they do not fall cleanly into the designated categories. While not an exhaustive account, these explanations offer an empirically

grounded basis for theorizing how the nature of the firm drives treadmill processes and environmental injustice.

Intersectionality

The CEJ framework emphasizes how diverse social categories interact to reproduce inequality and oppression. From a social embeddedness perspective, these categories are nested in the relational and structural features that define the operational logic of plantations. Illuminating relational embeddedness, James ([1963] 1989, p. 15) describes an interaction between an enslaved Black worker and a white plantation owner from eighteenth century Saint-Domingue demonstrating the legitimization of roles and identities in an oppressive hierarchy:

The majority of the slaves accommodated themselves to this unceasing brutality by a profound fatalism and a wooden stupidity before their masters. ‘Why do you illtreat your mule in that way?’ asked a colonist of a carter. ‘But when I do not work, I am beaten, when he does not work, I beat him—he is my Negro.’

In this exchange, the worker performs his role while emulating the master by transposing authority onto a nonhuman species, the mule. In contrast, Cuban planters explicitly forbade beating oxen because of their prized importance as work animals yet encouraged abusing enslaved workers as a disciplinary strategy (Fraginals [1976] 2008). The desire of producers to preserve hierarchies additionally affected their technological approaches. In northeastern Brazil, plantation owners clung to antiquated technology and rejected innovative tools out of fear that enslaved workers would rebelliously sabotage new equipment and that labor-saving technology might relinquish social control over people of color (Eisenberg 1974). Thus, these seemingly dyadic relationships are layered and involve categories beyond race and class, including the incorporation of nonhuman animals into the operationalization of norms, values, and power.

Violating the logic of appropriateness resulted in adverse consequences, as Rogers (2011) shows in northeast Brazil. Around 1990, a Black labor supervisor visited a white planter’s home to request unpaid wages for workers. The enraged planter inserted a gun in the worker’s mouth, and said “Rich, thanks to Princess Isabel, negro” (Rogers 2011, p. 125). This interaction is notable for two reasons. First, in cursing Princess Isabel, who decreed the abolition of slavery in 1888, the planter revealed long-held racial grievances. Second, the planter’s response stemmed from the sentiment that the worker “violated a crucial power hierarchy, one based on long-term traditions of labor control and marked by patterns of racial distinctions between bosses and workers” (Rogers 2011, p. 125). While this wage dispute may initially appear dyadic, a fuller interpretation of the interaction requires

understanding how the region's historically racialized social structure shapes the plantation's daily operations.

Other scholars note how race, gender, and sexuality interact to influence labor management and economic decisions on plantations. In northeast Brazil, Freyre ([1933] 1975, p. 10) nostalgically depicts racial, patriarchal, and authoritarian relations, recounting the adage: "White women are for marrying, *mulatas* for fornicating, black¹ women for work." While Freyre romanticizes slavery to argue that plantation miscegenation contributed to Brazil's distinct culture, critics rightly counter that power inequalities underpinned sexual coercion (Hodge-Freeman 2015). Moreover, Freyre's stance outlines the valuation hierarchy determining who is considered expendable, a dimension we address below.

In Cuba, intersecting social categories were fundamental for how elites intergenerationally maintained plantations. For McGillivray (2009, p. 120), *sobrinismo* (nephewism) shaped management and investment decisions: "Spanish bosses gave the best positions to their relatives, leaving Cubans with the lowest-paying jobs or no jobs at all. [Owner] Rionda explicitly stated... he wanted to keep all his mills in the family so that there would always be somewhere for his 'boys'—nephews and in-laws—to make a living." For white male elites, prospects for inheritance and marriage were mutually reinforcing and centered on hetero-patriarchal expectations. Similarly, in Brazil, the marriage patterns of white elites anchored asset management related to plantation ownership (Eisenberg 1974). Desires to reproduce a white, heteronormative male progeny therefore guided owners' economic decision-making.

The norms and power inherent in structural embeddedness also influenced the environmental conditions underpinning plantation survival. Rodney (1981) explains how European owners in Guyana used their power to coerce workers of color into protecting plantations from sea flooding. Described as a "steady work diet of mud and water in the maintenance of dams and the cleaning of trenches," laborers built the canals and irrigation systems feeding water into and draining water from plantations (Rodney 1981, pp. 3–4). The unequal power dynamics between workers and owners, who constantly worried their estates would be "swallowed by the sea," made the habituation of these racialized tasks possible (Rodney 1981, p. 5). Rogers (2009) likewise points to the "laboring landscape" characterizing Brazilian plantations. Black laborers, deforested land, sugarcane plants, and work animals all had defined roles and identities, which fell under the supervision of the white owner, whose interests reigned. Overall, the vast environmental inequalities defining the

social structure were oriented toward the differential valuation of people, species, and other ecosystem resources.

Fundamental to the organizational logic of plantations were hierarchies based on intersecting social categories. As defining features of relational and structural embeddedness, hierarchies guided short- and long-term strategies for economic survival and social reproduction. Echoing Polanyi (2001), non-economic interests, rather than the price mechanism, were central to firm governance and business decisions. As engines of growth and ecological disorganization, plantations operationalized oppressive and authoritarian ideologies to support treadmill acceleration. Thus the extraction of labor and value from Black bodies, nonhumans, and the soil give rise to the plantation, revealing itself as a terrain of socio-ecological struggle and a space of environmental injustices.

Multi-scalarity

In the CEJ framework, injustice operates through multi-scalar temporal and spatial processes reinforcing domination. On plantations, relations were embedded across time and space in multiple ways to shape injustice. For Tomich (2004, pp. 139–151), temporal relations structured social hierarchies and work routines on Caribbean plantations. On a daily scale, the common "unit of labor time" was daylight hours, with the time from sunrise to sunset used to measure the workday. On a weekly level, there were "white days" and "black days," with the former designated for cultivating plantation commodities and the latter reserved for enslaved workers to tend their garden plots. In this sense, "labor time became divided... between time belonging to the master and time belonging to the slave." These daily and weekly time horizons were important to the plantation's treadmill logic, as they (1) allowed workers to produce commodities for the plantation's profit and (2) externalized subsistence responsibilities onto enslaved peoples, a strategy white planters felt would lower costs and, out of racist fear of criminality, reduce enslaved peoples' free time. Lastly, establishing daily and weekly routines had long-term effects, as they broke the expectations and logics that Africans carried from their native lands. Accustomed to work routines organized by "mutual obligations, kinship ties, or social duties," enslaved workers had to adapt to plantation principles that were not self-evident. The historical habituation of tasks over decades and centuries involved learning new skills and accepting the planter's authority as normal and legitimate. Plantation owners therefore used the natural temporal rhythm of daylight availability and the seasons to manipulate enslaved workers and the soil to ensure maximum control over both. The multiple scales of time therefore intersected with the scale of the laboring bodies to siphon power upward.

¹ We do not capitalize the word "black" when it appears in lower case in the original quoted sources.

A focus on spatial relations allows for the study of the transmission of norms, values, and power at the local and global level. Locally, plantations were divided into spaces that provided logic to social, work, and racial relations. Masters lived in grand estates and dedicated the best land to sugarcane planting, and sited slave quarters and subsistence plots on inferior land. In sugarcane fields, the division of geographic units was based on a rationalized calculation of the amount of tasks a work gang could accomplish in a unit of labor time (Tomich 2004).

Globally, world-economic shifts deeply affected Caribbean plantations. Cuba is a case in point. Between 1760 and 1860, the world economy underwent a transformation in which an industrializing workforce increasingly demanded sugar and the British Empire abolished slavery. While the prevailing centers of slavery declined, new poles arose to supply raw materials. Tomich (2004, p. 79) describes the underlying formation of the “second slavery”: “The very forces that contributed to the destruction of slavery within the British Empire resulted in the intensification of slave production elsewhere in the hemisphere.” This profoundly impacted Cuba, where Spanish colonizers expanded cane production. Planters imported more slaves while deforesting land to cultivate sugarcane, construct railroads, and develop milling technology. The global transmission of social and economic forces therefore affected local plantation practices, including daily tasks, organizational structures, and the management of labor and environmental resources, which were central to treadmill processes. Moreover, slavery abolition in the British colonies certainly did not end economic trade between Britain and sites of continued enslavement, revealing how sustained relations of production across macroeconomic scales maintained the socio-ecological violence of the plantation.

Temporal and spatial relations also manifested in the exhaustion of land and soil. In Cuba’s sugarcane expansion, a plantation could only survive on a given site for 40 years until resource degradation made operations unviable. Soil exhaustion produced low crop yields, whereas deforested land decreased wood supplies for cane processing, eroded soil, and dried up water resources. When confronted with such depletion, a long-held practice for planters was to relocate operations to virgin land and repeat the multi-decade process once again (Monzote 2008; Fraginals [1976] 2008). Elsewhere in the Americas, this process fueled displacement of Indigenous peoples. For example, in the U.S., soil depletion was a direct result of an economy largely dependent on enslaved labor and a single crop (cotton), which necessitated the westward expansion of the chattel slavery system (Genovese 1988).

Multi-scalarity shapes the organizational behavior of plantations along several dimensions. From a temporal perspective, the daily and weekly management of plantations

anchored a short-term logic for economic and social relations, while normalizing and legitimizing long-term domination via the habituation of tasks. From a spatial viewpoint, the segregation of social and economic spheres on plantations reinforced power hierarchies, whereas the peripheral position of plantation societies left them susceptible to global pressures that alter local practices. These examples affirm the Polanyi (2001) insight that creating the fictitious commodities of land, labor, and capital to service marketization requires the degradation of human and environmental conditions, while also showing how multi-scalar dynamism undergirds treadmill processes on plantations.

Expendability

The CEJ framework contends that environmental injustice flows from perceived and lived expendability, the application of the ideology that certain populations are more dispensable than others. The differential valuation of human life in norms, values, and power permeates the social structure of plantations, reinforcing many of the hierarchies noted in the first CEJ pillar, including intra-human and human-nonhuman dominance. James ([1963] 1989, p. 17) describes how a Saint-Domingue governor depicted enslaved peoples:

What was the intellectual level of these slaves? The planters, hating them, called them by every opprobrious name. ‘The Negroes,’ says a memoir published in 1789, ‘are unjust, cruel, barbarous, half-human, treacherous, deceitful, thieves, drunkards, proud, lazy, unclean, shameless, jealous to fury, and cowards.’ It was by sentiments such as these that they strove to justify the abominable cruelties they practiced. And they took great pains that the Negro should remain the brute beast they wanted him to be. ‘The safety of the whites demands that we keep the Negroes in the most profound ignorance. I have reached the stage of believing firmly that one must treat the Negroes as one treats beasts.’

In this account, perceived criminality and animalization structured the ideologies planters used to rationalize plantation inequalities (Spiegel 1997). This narrative also demonstrates a key CEJ tenet—the racial discourse of animality, or the language often used to describe human behavior and relationships through nonhuman references and analogies, denoting a set of beliefs concerning how different bodies and populations are valued. The racial discourse of animality reveals how people frequently discuss race and racial politics in more-than-human language, which serves to strengthen a range of unequal power relations.

Such discourse still permeates plantation logic in northeast Brazil. A recent study (Carrillo 2020b) finds that mill managers are hostile to laws promoting universal education

and prohibiting child labor since they undercut the inter-generational reproduction of the sugarcane labor pool. That study revealed that elites defend child labor by comparing workers to animals, positing that dogs must be trained when they are puppies, otherwise they will grow into uncontrollable adults. Similarly, a mill director contends that mills need more state protections since they play a key role mitigating crime by employing uneducated workers. Calling sugarcane areas “a security belt” for the region, he speculates that mill closure would unleash a crime wave in which rural workers of color would migrate to urban areas and commit daily mass murder. The racialized language and ideology of criminality and animality therefore remain an active ingredient in the organizational behavior of plantations.

In nineteenth century Cuba, elites subscribing to “scientific” race theories worried that centuries of African slavery would doom national development, yet also saw miscegenation as a redemptive path toward whiteness. This racial thinking coincided with the realization on mills that slavery abolition and wage labor were imminent. While planters wanted to recruit free white labor to whiten the nation, a critical impediment was “the stigma attached to sugarmill work as strictly for blacks” (Fraginals [1976] 2008, p. 134). For planter and thinker Francisco de Arango y Parreño, the meso- and macro-level dilemmas could be solved through strategic racial and labor management, which rested on ideas of expendability (Fraginals [1976] 2008, p. 134):

He [Arango] spoke of setting up [sugarcane] colonies in suitable places which would be half workers direct from Europe and half black women. The idea was not crossing black men with white women, but white men with black women, in conformity with a simple demographic calculation: the white woman must not obstruct the island’s ‘whitening’ process by having mulatto children; the black woman, on the other hand, would procreate mulattos and thereby hasten the process. The situation in which this would leave black men was not mentioned.

The solution for whitening the nation and for eliminating the racial stigma of sugarcane work was the same: remove Black men from Cuba to cement a racial hierarchy of white over Black, a gender hierarchy of (white) men over (Black) women, and a species hierarchy of (white/male) human over nonhuman.

Such practices comprised a broader organizational model that engineered and rationalized early Black death as part of daily management. For instance, due to early death rates among the enslaved in the British Caribbean, planters provided a yearlong period for enslaved elders to socialize newly arrived Africans. Local physicians considered this “seasoning period” necessary since inserting a worker directly into a standard routine would be akin to “murder”

(Richardson 1983, p. 67). Generally, brutal work accompanied malnutrition, food scarcity, pervasive illness, and high infant mortality rates. During periods of high prices for imported food, owners opted to save money by allowing mass starvation among the enslaved. While early death was “an unceremonious event for the planter,” the enslaved population held extravagant funeral ceremonies with pageantry and music (Richardson 1983, p. 71). An expendability threatening to shorten the life-course of enslaved peoples was therefore embedded into work routines, daily habits, and societal expectations.

Notions of expendability and labor management were intertwined in the organizational behavior of plantations. Returning to Coase’s (1937) inquiry on why firms exist, elite testimony reveals that the firm’s key function is to operationalize and sustain racialized, gendered, and ecological hierarchies in economic activities. These accounts demonstrate that firms are important entities for the institutional management of risks and information related to desires to dominate and fears of authoritarian decline. Reinforcing Polanyi’s (2001) claim that ideologies have market-making power, elites use employment relations on plantations to translate prejudicial norms, values, and power into real-world economic activities.

State-vested power

For the CEJ framework, state power buttresses injustices by using legal and institutional mechanisms to sanction unfair treatment, through multiple means, including the courts, legislative and policy-making bodies, the military, and other entities. A central claim in managerial authority is that power flows from the legal definition of employment structuring the conditions in which labor relations operate (Williamson 1975; Coase 1937; Freeland 2009). The state was central to upholding trading and labor markets and endorsing within-firm hierarchies upon which plantation logic depended. The most glaring example is slavery, where states created the commercial and regulatory conditions to convert Africans and other non-white groups into private property (Marable 1983).

However, state power has backed planters’ desire to control humans beyond slavery. In Argentina, Juarez-Dappe (2010, pp. 88–90) shows how two laws—the 1877 police code and the 1888 servants law—placed workers under the control of plantations and mills. The former changed vagrancy laws to declare anyone with “insufficient means of survival” to be sentenced to sugarcane work, with permits required to leave the plantation. The latter expanded the former’s jurisdiction by (1) requiring the conscription of children, (2) restructuring debtor rules so that plantation work, rather than cash, was the only way of settling outstanding debts, (3) extending legal workdays during the harvest,

and (4) strengthening punishments against unpunctual or run-away workers. In this sense, these laws corresponded with the labor needs of plantations, as their enforcement followed the seasonal rhythm of worker demand for harvests and instilled the very type of workforce discipline that owners desired.

There is also a long tradition of states conferring power for private surveillance and policing. Private watchmen monitored workers, suppressed revolts and collective organizing, and guarded against run-aways. With the state's implicit and explicit endorsement, private security regimes on plantations complemented public laws (Juarez-Dappe 2010). In northeast Brazil, public and private power overlapped in the domain of security, as the kin of plantation owners often commanded rural police and militias. These policing units reinforced the power hierarchy by intimidating and assassinating labor organizers (Freitas 2003).

States additionally uphold inequalities through the uneven enforcement of seemingly progressive legislation. For example, in Brazil, the 1943 Consolidation of Worker Laws conferred labor protections, such as a minimum wage and social security. However, the legislation exempted rural workers, allowing planters to continue dominating workplace hierarchies (Pereira 1997). More recently, as national environmental legislation in Brazil prohibits the practice of pre-harvest straw burning, the federal government excluded producers in northeastern states (Junior 2015). By bestowing northeastern producers with the power to burn straw, while prohibiting the practice elsewhere, the state endorsed the perpetuation of injustices that harm public health and emit carbon (Carrillo 2020b).

These examples illustrate how the state endows managerial authority with power and legitimacy. States create the legal structure for employment relations outside and inside the workplace. Externally, states engage in violent labor recruitment and retention, which interact to keep workers captive to plantation interests. Internally, states grant power to plantation overseers to manage the workplace hierarchy. Further, exemptions for rural work regulations and environmental standards allow plantations and mills to maintain harmful practices. State power is thus fundamental for buttressing the external market conditions in which plantations operate and the internal hierarchies that guide the organizational logic of plantations. Echoing Polanyi's (2001) central critique of self-regulating markets, the state upholds the individual unfreedom and ecosystem destruction necessary to sustain the marketization serving political-economic elite interests.

Overall, states reinforce the other three CEJ pillars by creating the legal institutions and economic policies that guide the organizational behavior of plantations. In the aforementioned cases, states not only upheld racial, gender, and class hierarchies on plantations, but also granted power

to producers to destroy biodiversity and engineer flora and fauna to meet production demands. Public power bolsters the managerial authority inherent to treadmill processes on plantations and mills, as such legal backing helps instill logics of appropriateness in employment relations. Thus any efforts by civil society, labor, or other would-be social change agents to achieve environmental justice under a plantation economy must contend with state power, which generally serves to sustain industry dominance. This is a conclusion consistent with both the ToP and CEJ frameworks. However, CEJ tends to overlook how state power works in tandem with managerial authority and firm culture, an oversight this paper addresses. These dynamics also reveal that the kind of power requiring quiescence and unquestioning obedience from subservient stakeholders, like the enslaved, is anything but inevitable or "natural" (Lukes 2005); rather it is manufactured and sustained by extraordinary exertions and investments by elite actors and institutions.

Conclusion

This paper asks: how do firms operationalize diverse social forces to produce environmental injustice, and what organizational logics sustain these inequalities over time? We argue that social embeddedness and managerial authority are useful concepts from economic sociology for answering these questions. We bridge these concepts with environmental sociology by engaging with the CEJ and ToP frameworks. CEJ offers helpful tools for understanding how injustices are produced, but underemphasizes the role of the firm. The ToP framework is useful for addressing that gap by exploring how the broad dynamics of capitalism and corporate behavior routinely result in socioecological harms. However, the ToP provides little insight into firm-level organizational practices. In this paper, we integrate the CEJ and ToP perspectives with social embeddedness and managerial authority to provide a more robust understanding of how firms generate and reproduce environmental injustices. We ground and support this argument through the case of sugarcane plantations in Latin America and the Caribbean. This analysis of plantations further affirms Polanyian critiques of self-regulating markets and insights on how pernicious inequalities emerge from particular forms of market embeddedness in state, society, and nature.

The first CEJ pillar focuses on how intersectionality—the intertwined nature of multiple social categories and axes of inequality—is entangled in the production of environmental injustices. We find that a range of identities and societal expectations reflect and include how race, gender, class, sexuality, and other social categories (including non-human species, plants, and land) shape relationships within firms and the culture of a firm. Specifically, within plantation

economies, these social forces influence the contours of power and environmental justice struggles by guiding and containing the power of human labor and extraction of value from Black bodies and the soil. These tensions are emblematic of how social embeddedness—the social and non-economic factors shaping economic decision-making—is a core element of firm behavior because they point to how ideas about social difference and human dominance over nature are fundamental to that economic model.

The second pillar centers on the importance of multi-scalarity in the production of environmental injustices. In the sugarcane plantations of Latin America and the Caribbean, owners, managers, and overseers deployed the scales of time and space to reinforce racial hierarchies, racial divisions of labor, and domination over both enslaved people and multispecies landscapes. Therefore, we document how multiple scales of inequality bring to light the complex architecture of social embeddedness within firms and how the daily activities and existence of its workers are channeled and constrained.

A third CEJ pillar addresses the phenomenon of expendability—a brutal ideological, discursive, and material force that determines differential valuation across social and ecological geographies. Within plantations as firms and in plantation economies, one observes expendability in the language that managers and government officials express that regards its workers (and their related communities) as inherently inferior beings, prone to criminality and unsavory behavior. While these ideas are abhorrent, their sociological purpose and impact is clear—they provide enduring and significant support for a violent organizational infrastructure. Furthermore, when workers whose labor is no longer required to maintain the plantation are deemed expendable, such decisions reveal the firm an ideal site for the study of struggles over who society values and devalues.

The final pillar emphasizes state power in environmental justice struggles. The impact of state power in firm relations reflects our view that the firm is central and not separate from the kinds of institutional power that produces injustices. The ToP framework also views state power as a core element in environmental and labor politics in that governments and corporations across multiple national contexts tend to cooperate to uphold the status quo. Specifically, corporations seek to maintain control over their workforces and increase profits where possible, and governments seek to preserve their resource base, and thus legitimacy, by ensuring that firms and workers generate tax revenue. And within the firm, we find that managerial authority is ultimately derived from the power of the law, the court system, and police.

In discussing the gendered and racialized dimensions of social embeddedness and managerial authority, this paper also outlines some new pathways for research on racial

capitalism. Building on the work of prominent scholars of racial capitalism (James [1963] 1989; Robinson 1983; Rodney 1981), we show that plantation profit-making depends on an organizational structure that captures, transmits, and institutionalizes ideologies related to authoritarianism, patriarchy, and white supremacy. Furthermore, policing practices and policies anchor the labor management of such organizations (Gilmore 2007). While this paper pinpoints a selection of the firm-level mechanisms sustaining racial capitalism, future research is needed that brings theories of race and racism to bear on economic sociology debates (Hirschman and Garbes 2019), especially in relation to environmentally hazardous firms.

We thus contend that firm-level practices play a highly significant role in the generation and maintenance of environmental injustices and that environmental and economic sociologists should pay closer attention to the internal practices of these institutions and organizations across society. In studying the nature of the firm, one can understand how ideology and institution interact to guide operational practices engendering unequal treatment.

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