

## **“Freedoms” and (Toxic) Opportunities in the Global Pesticide Complex**

### **Abstract**

Building on existing scholarship that foregrounds caste and its ecological entanglements this paper develops a framework that I call Critical Caste Ecologies. By challenging the dominant paradigms of environmental justice shaped by both Western epistemologies, the framework traces the materiality of caste relations and how they are maintained and reproduced by socio-environmental change. I first compare Critical Caste Ecologies with Critical Environmental Justice studies, demonstrating their shared concerns as well as how they differ. Drawing on ethnographic data, I then examine caste in conjuncture with agrochemical environmental harm. By analyzing the emergence of pesticide stores and agrochemical networks shaped by “Backward Caste” farmers, this article highlights how caste based social relations are actively reproduced by simultaneously transforming rural ecologies and Dalit livelihoods. I conclude by highlighting the advantages of using Critical Caste Ecologies as a tool to unpack caste-based differentiation and its impact on socio-ecological life.

*Keywords: Caste, Critical Environmental Justice, environment, India, caste ecologies*

## INTRODUCTION

Badri, a dominant “backward” caste farmer, had hired 5 Dalit laborers, members of the lowest social caste, to create a drainage system across his farm. He wanted to take precautionary measures to save his vegetable produce from a potential deluge. He cautiously watched the landless Dalit workers. Then he intervened and scolded them. And then he watched some more. I asked Badri if he had always grown vegetables. He responded, “we are Koiri caste, we are dedicated and technical farmers. Have you seen Badri Agrichemical Store in the market? My son operates it.” Badri was referring to one of several pesticide stores in the nearest market that are, coincidentally or not, all owned by families from the Koiri, a cultivating caste classified as OBC, or “Other Backward Caste,” in the region of Bihar. In India, OBCs is a collective term used by the Government of India to classify castes that are socially and educationally disadvantaged, yet many of these castes are dominant in specific regions (like the Koiri in Bihar) due to their land ownership, cultivator identity and political hold. “I see!” I responded. “Are all Koiris farmers?” He responded, “since generations, but earlier it was mota anaj [staple millet crops], tobacco and rice, now all kinds of dawai [a synonym for chemical inputs literally translating to medicine] are available so hardworking Koiri farmers have shifted to veggies.” Meanwhile, the Dalit laborers he had hired refused my interview requests. When I asked why, one said “he [Badri] will get upset... he owns us for the evening.”

This interaction is important for the contextualization of this paper’s argument. Environment, including land use and access to agricultural technology, plays a critical role in sustaining caste hierarchies. Here, the Koiri caste has historically leveraged access to land and control over agricultural resources to assert dominance, contrasting sharply with Dalit laborers’ dependence on daily wages. Badri’s pride in his Koiri identity and his family’s role in the

pesticide trade signify a shift in agrarian hierarchies shaped by agrochemical modernity. His claim about Koiri farmers' hard work and technical skills reflects a narrative of self-ascribed superiority tied to their adoption of intensive farming practices. This contrasts with Dalit laborers' exclusion from land and resources. This is typical more so in Bihar, where caste structures dominate social, political, and economic life, with caste-based identities and hierarchies deeply influencing access to ecological resources, power, and opportunities (Chakravarti 2001, Sharma 2005).

Yet, despite clear ties to colonialism, land, and justice for over a billion people globally, caste remains largely absent in sociological discussions about the environment. This is problematic for several reasons. First, India's population alone rivals that of Europe and North America combined, with caste also present in Bangladesh, Sri Lanka, Nepal, Pakistan, and increasingly recognized in places like United States. Second, due to the Brahmanical hegemony in social sciences the questions of caste are often dominated by upper-caste perspectives shaping epistemologies, methodologies, and academic discourses (Guru 2002), making it difficult to analyze one of the world's major forms of stratification in its own terms. Third, a more global, non-Western and anti-Brahmanical perspective is critical to understanding the links between social differentiation and ecological injustice (Sharma 2022; Ranganathan 2022a). A growing body of scholarship is now striving to foreground caste and its intricate ecological entanglements, emphasizing the urgency of a perspective that critically interrogates and dismantles caste structures (Sharma 2017; Bhaviskar and Gidwani 2019; Bhimraj 2020; Ranganathan 2022b; Prasad 2022). This paper adds on this this body of work by developing a framework that I call Critical Caste Ecologies. It aims to at once render visible yet also critically probe dialectical relationships between caste and environment. By tracing the historicity and

materiality of relations of caste that are maintained and reproduced by socio-ecological struggles, Critical Caste Ecologies demonstrates how sociologists can examine caste inequalities and environment in multifaceted ways.

To theoretically ground this argument, I will draw from of Critical Environmental Justice studies (henceforth CEJ) along with scholarship that articulates caste through the lens of racialization, as both an inspiration and a foil. Like CEJ studies, my argument builds on the notions of the logic of domination and multi-scalarity (Pellow 2017). But unlike CEJ studies, Critical Caste Ecologies focuses on one form of difference in order to examine unique characteristics that are not typically addressed in environmental justice work. Moreover, I rely on scholars that draw on the intersection of caste and environmental injustice through examination of parallels between Dalit and Black ecologies (Sharma 2019,2022; Prasad 2022). Dalit ecologies analyzes the intersecting dynamics of caste-based segregation, dispossession, and dehumanization, alongside the systematic appropriation of Dalit labor and ecological knowledge. It also interrogates how the global ecological crisis amplifies vulnerabilities and perpetuates environmental injustices disproportionately affecting Dalit communities in India. My work builds on this by drawing on the existing strengths of social theory (Foster 1999, York and Clark 2006, Holleman 2015), political ecology and agrarian studies (Galt 2008; Luna 2020; Shattuck 2021, Werner, Berndt and Mansfield 2022; Mansfield et al. 2024) accentuating the underexamined historicity and materialities that rearticulates caste. The historical and material method emphasizes the importance of examining the material bases of social relations and environmental impacts, recognizing how economic and ecological systems are interconnected through historical processes of development and exploitation. This focus helps us understand how landscapes, socio-ecological injustices and agrochemical harm are dialectically shaped via

caste relations. Finally, CEJ is overwhelmingly western in orientation. Critical Caste Ecologies seeks to decenter this Western perspective and simultaneously challenges the embedded caste blindness of Indian environmental discourses.

This paper's empirical focus stems from an ethnographic study in Bihar, India, analyzing the shift from traditional crops to chemically intensive vegetable farming for local markets. The paper asks, how are caste relations reinscribed and sustained through the introduction of new agrarian technologies? Green Revolution technologies in the 1990s transformed agronomic practices, increasing food productivity while simultaneously lowering prices for traditional crops (Kantor 2020). This structural and contingent change spurred the rise of commercial vegetable farming as a profitable enterprise. As a result, OBC farmers began investing more in cash crops, significantly boosting vegetable production in the region. This transition, deeply intertwined with caste relations, land arrangements, and the intensified use of chemical inputs, has both perpetuated and altered existing social inequalities and ecological harm, making it a compelling case for the development of a Critical Caste Ecologies framework.

The remainder of this article is organized as follows. First, I provide a primer on caste and how it operates. Then I provide a review of CEJ studies and racialization. This section sets the background for my argument that the transposition of CEJ and racialization to caste contexts is not wrong but must be done carefully for it may also create analytical barriers to our understanding of environmental injustices. Here, I build on select scholarship that explores the intersection of caste and socio-environmental issues, examining how shifts in caste relations intertwine with the political ecology of agrochemicals and the broader social configurations they engender. Following this, through a synthesis of literature available on caste, land and agrarian relations, I demonstrate how historicity and material relations of caste conceptually elucidate

conversations concerned with social and ecological entanglements. I then employ fieldwork in Bihar, India to tease out the above-mentioned conceptual tools through empirical work. In conclusion, this article underscores the benefits of employing Critical Caste Ecologies as a framework to analyze caste-based differentiation and its implications for socio-ecological dynamics.

*Materiality: “Related to the Soil”, Interaction of “Experts” with Pesticides and Land*

I am not even kidding! All the *davai* stores are of Koiri farmers. Because they already have the technical knowledge, they have invested in making more money off this knowledge. They have opened shops not only here in the village but also in the main market. So, you find a lot of them giving advice or telling people what sort of pesticides, fertilizers or seeds are good for farmers.

The Green Revolution led shift in the farming practices has also resulted in burgeoning agri-business set up in the region exclusively by Koiri caste farming families. Over a stretch of 15 kilometers between my apartment and my research site, I encountered around 20 retail stores—all owned by Koiri families. These have become the main point of contact for “new farmers” seeking advice for their vegetable produce<sup>1</sup>. This commercial market of synthetic chemicals has exerted a significant influence on the materiality of caste within the region, particularly in relation to agribusiness retail and land arrangements. This material transformation has served to solidify the role of the Koiri as the caste at the heart of agrarian production relations within Bihar's agroecology and at the same time elicits anxiety and distress for Dalits.

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<sup>1</sup> Aga's (2018) study of petty retail store of chemical inputs also finds caste-based association of merchants in Maharashtra western India. The Marathas, a dominant caste, in the region too have become ‘merchants of knowledge’ when it comes to advising inputs to farmers.

Take Rohan who is a Koiri pesticide and seeds retail owner. As we drank tea together in his shop, he declared in a loud tone, “We are related to the soil... Our job is to serve the kingdom, not rule. My store does exactly the same. I share my technical knowledge with the farmers that need help.” Acknowledging the fact that OBC Koiri farmers do not “rule” the agrarian relations like the landed upper caste, Rohan embodies an identity of serving the people through the inputs retail store and his knowledge. I asked him what sort of help farmers need. He responded “it’s the *naya kisaan* [new farmers] that has less idea of chemical inputs and poison [pesticides], Koiris just walk in and ask for the medicine... they don’t need any explanation. The *naya kisaans* needs to be told so as to be sure that they are using the inputs in the right manner.” New farmers are typically lower caste Dalits agricultural laborers who see vegetable farming as new opportunity that is far more respectable than working for someone else. But Rohan's statement—“we [Koiri] are related to soil”—raises important questions. How does this deep connection between the Koiri and the land, combined with the proliferation of pesticide stores, influence ecological transitions, soil fertility in the region and the reproduction of caste relations? How does the beforementioned colonial history of Koiris inform the present?

In his examination of the opium trade in Bihar, Pinch (1987) delves into the cultural significance of the Koiris. Pinch uses archival data that suggests Koiris have attained a stature symbolized by their perceived “victory over soil” (Pinch 1987: 50). This status, however, extends beyond the realm of culture and is deeply material. The historical identity of the Koiris as diligent tenants and farmers has materially molded their dominance, particularly evident in their contemporary ascendancy within the agri-business retail sector of the region. I argue that the emergence of pesticide stores and the dominance of Koiris in this agrochemical enterprise must be analyzed not as evidence of their “natural” or “essential” agricultural skill but as material

shifts that actively reconfigure caste relations. These stores and their associated networks are not neutral economic spaces; they are deeply embedded within caste-specific socio-material processes. By shaping the flow of resources, transformation of ecosystem and transaction of agricultural knowledge, these retail stores, perpetuate and amplify caste-based social difference. Furthermore, the materiality of agrochemical infrastructures—ranging from the physical presence of the stores to the distribution mechanisms—serves as a conduit through which caste-based social and ecological inequalities are reproduced, with profound consequences for rural ecologies and Dalit livelihoods. This analysis underscores the co-constitutive relationship between material environments and caste dynamics, challenging reductionist views of caste as either static or solely cultural.

These agrarian changes are deeply tied to the political ecology and economy of agrochemical harm. The rise of caste-based agri-input retail reflects a reconfiguration of pesticide capital (Mansfield et al 2023), highlighting shifts in how this capital is embedded in local social structures. The broader eastward expansion of agrochemical production aligns (Galt 2008; Shattuck 2021) with strategies of capital accumulation that are shaped by regional forms of stratification. The agrarian history of the Koiris and their localized practices play a central role in the pesticide supply chain, embodied in the proliferation of retail store networks. These changes are intricately linked to empirical transformations such as the rise in vegetable farming and the structural distribution of agri-inputs, illustrating the intersections of caste, capital, and agroecological dynamics.

While Koiri's were given the essentializing accolade of “victory over soil” for their standing in Bihar's agrarian rural ecology, the turn toward chemical intensive vegetable farming in the region has reconstituted and reconfigured their relation with contemporary soil fertility as

well. The pesticide retail stores have become an avenue through which Koiris craft a new *relation to soil* as articulated by Rohan above. The conjuncture of pesticide retail, the reassertion and (re)articulation of caste identities, and input-intensive agriculture sheds light on the ecological harm driven by agrochemicals and their social assemblages. Farmers, such as the Koiri participants in my study, explained the entrenchment of chemical-intensive practices, noting the near impossibility of transitioning to organic farming due to the protracted process of soil restoration. As Vijay put it, “The land in the region has reached a state of exhaustion, and this ecological harm cannot be repaired.” This sentiment reflects the broader cycle of dependency fostered by agrochemical capital. Vijay and his brother highlighted how long-term pesticide use has paradoxically made pests more resistant, leaving crops increasingly vulnerable to diseases. They noted that even solutions marketed for soil rejuvenation often introduce new problems, with additional chemical inputs creating a continuous cycle of dependency rather than addressing the root ecological damage. Such experiences resonate with critical studies of agrochemical harm, which document how chemical inputs perpetuate soil degradation and pest adaptation (Werner, Berndth and Mansfield 2022).

While many Koiri farmers acknowledged the theoretical benefits of diversification, such as seasonal crop rotation, they also emphasized the practical constraints imposed by the necessity of cash crop cultivation for immediate livelihoods. This reliance on high-value crops exacerbates their dependency on pesticides, deepening ecological harm and tethering agrarian livelihoods to the broader dynamics of environmental injustice.

And yet, for OBC Koiri farmers, these retail stores are nothing less than solidified dreams and aspirations for better off opportunities for them and their caste. They have successfully co-opted their caste-based *relation to soil* and its material entanglements via mushrooming inputs

retail stores. Ankit, a sales representative in a multinational seed company invited me to the grand opening of his new venture, a synthetic inputs' retail shop. On asking what motivated him to venture into this business he mentioned how he has experience of working in the sales sector of multiple agri-businesses and he thought that it was about time that he opens his own store. His father sitting next to him proudly pats his shoulder adding "now I plan to rest! My family is well settled." Ankit beamed and told me how he had only started with a monthly income of INR (Indian Rupee) 8000 (roughly \$95) as a market development representative. Now he earns almost INR 35000 (roughly \$415). Ankit credits much of his success to his father's farming background, a common narrative among Koiri agri-business retail store owners. Many of them recognized that their early experiences in farming provided them with the knowledge and skills necessary to navigate the growing market for synthetic chemicals, fueled by the rise in commercial vegetable farming. Testimonies like those of Ankit and Rohan reveal the connection between the materiality of agri-businesses and their roots in caste identity. The demand for synthetic chemical inputs during my fieldwork was almost palpable—a constant buzz of conversation among farmers, focused on the high costs and the inevitable necessity of these inputs. A Critical Caste Ecologies perspective stresses on focusing on these embodied and deep entanglements between agricultural modernization and enduring material significance of caste in shaping new opportunities.

The interaction of Koiri cultivators with vegetable production and their alleged expertise is thus reconstituted in new ways, altering yet also entrenching the caste's material position in society. For caste's relations with soil and land is now, in part, embodied in their caste's specialized relationship with pesticides (and, by extension, the global agricultural corporations

that produce them). The historical identity of the Koiri farming families and the existing material conditions converge to shape social hierarchies and economic opportunities in the agroecology.

In contrast, Raja, a non-Koiri OBC caste farmer, tried hard to secure a shop for agrichemical inputs in the chowk, but failed. He failed because of his lack of ties to Koiri retail store owners. Instead, Raja began selling chemical inputs from his house, the outside of which was now lined with makeshift shelves for chemical products. When I asked about these, he responded, “I am trying to establish this business, but the Koiris are established and widespread in this business. I had to let go of the plan.” Meanwhile, Raja was invited to undergo a 3-month training by, a leading multinational agribusiness company, in Hyderabad, India. This provided him with a certificate to sell seeds and synthetic fertilizers, one he framed and proudly hung in the entrance of his house. Raja acknowledged that the market of inputs is on the rise in the region, but also that he will have a difficult time competing with Koiri-owned businesses. Indeed, few costumers came his way, and he is making other plans so he does not have to depend solely on his agri-business.

In addition, while Rohan proudly claimed that Koiri farmers know exactly what they need for their crops, the reality for new Dalit farmers interacting with these retail stores and Koiri shopkeepers is often far from straightforward. These everyday encounters can be stressful and fraught with uncertainty, as new farmers grapple with inflated prices of land contracts, unfamiliar products, the pressure to make the right choices because of their new relationship to farming and chemical inputs. I also find that pesticide stores evoke intense emotions of fear, distrust, and anxiety among marginalized groups due to the ways in which these stores' material presence perpetuates caste and gender-based inequalities. Take the example of Prema Devi, a Dalit woman who, alongside her son, has found independence and pride through farming. Her

husband, employed in construction in Kolkata, sends savings that enable her to rent land on a yearly contract, with her son assisting in the cultivation. This financial support empowers Prema to break free from the cycle of working for Koiri farmers and upper caste landlords in exchange for meager wages, enabling her to build a livelihood on her own terms (Ramamurthi 2011).

Vegetable farming has provided her with a better option. One afternoon, after heavy rainfall, she appeared visibly distressed as she prepared to visit the market to buy fungicides for her crops. Before making a purchase, Prema pulled out her smartphone and showed me a picture of the chemical inputs that the store owner had recommended. However, she didn't buy the fungicide right away. Instead, she cautiously sought advice from nearby farmers and even consulted me, worried that she might be sold the wrong product, which could not only damage her crops but also cost her significantly.

As a new farmer, Prema feels both proud and fearful. She shared her concerns about store owners who often pressure new farmers into buying additional, unnecessary chemical inputs for their own profit. For her, these extra costs are a burden, and being illiterate and unfamiliar with the chemicals, she is determined to be extra careful with her purchases. Rohan jokingly told me something similar when I saw Rama devi, a Dalit farmer, inquire about a pesticide and then walk away. He tells "they [new farmers] come in two rounds. Once they will come and inquire the price. Then they will go to another store[laughs] and even then, they are not satisfied so they ask other farmers around before finally purchasing a product."

Navigating pesticide stores as a new farmer, particularly for those from marginalized backgrounds like Prema is a weary experience. The interplay of pride and fear in these situations highlights the delicate balance that new farmers must maintain as they strive for independence while dealing with the uncertainties of unfamiliar synthetic chemicals. Prema as well as other

women's experience as new Dalit farmers illustrates the complex intersections of caste and gender. For Dalit women like her as illiteracy and limited access to agricultural knowledge exacerbate vulnerabilities, Prema's caution in dealing with pesticide sellers is not merely a pragmatic response but also a layered expression of resistance and survival. Her wariness symbolizes an active defiance against the systemic inequities that marginalize Dalit women in rural India, where access to agricultural resources and knowledge is often mediated by caste and gender hierarchies. By navigating the marketplace with skepticism, Prema resists being exploited by sellers who might overprice products, misrepresent their efficacy, or promote harmful chemicals without full disclosure.

Rohan's remark about Dalit farmers' hesitance in purchasing reflects a broader societal stereotype of Dalit "ineptitude," further complicating their positionality in agricultural modernization. At the same time, Prema's careful approach to purchasing fungicides underscores a survival strategy born out of lived experience and socio-economic constraints. Without formal education or institutional support, her reliance on observation, intuition, and cautious decision-making becomes a form of self-reliance. This duality of resistance and survival illustrates how Dalit women like Prema negotiate agency within oppressive structures, challenging systemic harm while carving out pathways for independence and resilience. In tracing novel material relations of caste via a critical caste ecologies perspective prompts us to understand these agri-business retail stores and their interaction with ecology, soil fertility and different stakeholders do not serve as impartial arenas. They clearly adapt in the existing uneven caste relations and continue to shape the contradictions risen by new farming opportunities and agricultural modernization.

The assertion of Koiris as *related to soil* has also impacted the ways in which land contracts are experienced by Dalit communities. Vegetable farming is seen as one of the most lucrative livelihoods in lack of other opportunities in the region. This has imposed an exclusive material strain on the land arrangements. Chemically intensive farming not only causes ecological harm and soil degradation but has also led to a significant increase in the prices of yearly land contracts furthering the landlessness of Dalits leading to limited opportunities and serving the interest of Koiri farmers.

Previously, landless Dalit families often relied on upper-caste landlords to secure land through yearly contracts or sharecropping arrangements to grow staple crops such as rice, wheat, and corn. With the increasing interest in growing vegetables for profit, however, Koiri farmers, who own small amounts of land, are persistently reaching out to upper-caste landlords for additional land on yearly contracts. For they are willing to pay triple the amount these landlords receive from Dalits through these contracts. This pattern has made the previously affordable land extremely competitive among the Koiris and almost unaffordable for Dalit laborers (re)producing inequality on the basis of materiality of land and caste. Urmila, who not only works for upper-caste landlords as an agricultural worker but also used to rent land to grow vegetables with money sent by her migrant husband, told me that it is next to impossible to secure land these days. "A couple of years back it was still affordable. We could rent 1,300 square feet for as low as INR 500 yearly (roughly \$6). But now the Koiris are ready to pay INR 2,000 (roughly \$24) for the same amount of land. Of course, the landlords will favor them [Koiris]." Kishan, another Dalit laborer turned farmer, complained about the prices of the land contracts. He added, "Poor families can't pay that amount even if they want to... there is too much risk." He mentioned how no one in the region will reveal to me the question concerning

genuine prices of the land contracts because they fear that if it becomes public knowledge, someone who needs land for growing vegetables will pay more and secure land from the landlords. Due to small portions of land that are owned by OBC farmers they are ready to maximize their yield by procuring more land for profits.

In sum, these novel land arrangements, increased prices and the growing pesticide stores reveal how materiality of land is crucial in producing socio-ecological differentiations along caste lines. Here it is crucial to also point out that the Critical Caste Ecologies framework demystifies social and ecological aspects of caste inequality in terms of binaries of Dalits vs upper-castes. Instead of emphasizing a relational approach, it rather elucidates how tensions between OBCs and Dalits bring forth caste and its ecological injustices as a mesh of interconnected struggles.

## CONCLUSION

According to Ankit, 95% of the agribusiness retail market in the region is controlled by Koiri farming families. The district hosts 160 retail centers, with his corporation setting an ambitious target of INR 20 million in yearly sales. Here, caste dynamics are clearly entwined with capitalist agrochemical enterprises, exposing the deep-rooted socio-economic and ecological injustices at play. The above exploration into the historicity and contemporary material dynamics of Koiri farmers, and Dalit agricultural laborers in Bihar reveals this complex interplay between caste, ecology and livelihoods. Rather than simply including caste to a well-known list of social differentiation, this contextual approach demonstrates the multifaceted connections between caste and its environmental relationship. While the interplay of power,

privilege, reproduction of inequalities and marginalization is a common thread in both CEJ and Critical Caste Ecologies, a critical caste ecologies perspective enhances existing conversations by uniquely situating local caste dynamics within the broader context of global ecological harm and injustice, while remaining true to the mechanisms and conjunctures that perpetuate caste inequality.

This paper delves into the embodied and social dimensions of chemically intensive vegetable farming in Bihar. It reveals how the persistent portrayal of OBC farmers as industrious and skilled experts is the continuation of historically entrenched caste relations. These farmers, now hailed as the "pioneers of vegetable farming<sup>2</sup>," carry forward a legacy deeply rooted in the region's caste-based agricultural, land, and agri-input materiality. A Critical Caste Ecologies perspective reveals the continued contradictions of caste-ecological relations by an examination of agrarian modernization and its differing bearings on dominant cultivator caste and landless Dalits. As Green Revolution "advancements" shifted the background conditions for agriculture in the region, this shift combined with a historical reliance on upper-caste landlords to create new opportunities for OBC Koiri farmers. Their identity as "skilled" and "industrious" cultivators has thus been reshaped and reinforced within the land-pesticide nexus that now dominates the region. Koiri peasants have become influential, using their expertise and knowledge to enhance their limited caste status. This expert identity is rooted in material and caste dynamics established during colonial rule. Additionally, Koiri farmers have reinforced their traditional status as expert cultivators through the material proliferation of agri-business retail stores, land contracts which

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<sup>2</sup> An upper-caste professor, who also serves as a landlord and has ties to the regional agricultural university, used the term "pioneers of vegetable farming" during her interview. Her choice of words underscores the dominance of OBC Koiri farmers in vegetable farming within Samastipur, reflecting both the entrenched caste dynamics and the power they wield in the agricultural landscape.

offer them hope, aspirations, and social mobility, while the interactions with chemical inputs evoke distress and anxiety among emerging Dalit farmers.

Driving ecological change and uneven social transformation, agrarian modernization creates new opportunities for OBC farmers but simultaneously reinforces social inequalities, particularly for Dalits. The contradictory nature of agribusiness stores reflects this tension—they offer advancement for some while deepening marginalization for others. For Dalits, navigating these socio-ecological shifts is fraught with difficulties, as rising land prices and entrenched power relations hinder their ability to benefit from these changes.

These findings have significant implications for understanding socio-ecological harm in a global context. The historical and material dynamics of caste intersect with aspirations for social mobility and gender, shaping the everyday experiences of communities dependent on agrarian ecologies. Meanwhile, profit-driven agribusiness practices exacerbate ecological degradation by impacting land and soil fertility. Future works on Critical Caste Ecologies will pay more attention to the point that caste hierarchy is disrupted and materialized not only as a unique category of inequality that guides socio-environmental relationships but also as a relational category that unsettles class, status, gender and other dimensions of differentiation. This study contributes to the limited sociological analysis of caste's environmental dimensions and raises critical questions for future research. For instance; How can the intersection of caste, labor, and environmental degradation in India inform a more nuanced understanding of socio-environmental inequalities in other regions, such as Latin America or Africa? In what ways do caste and ethnic hierarchies in agrarian economies complicate global comparisons within environmental justice scholarship? How can CEJ be adapted to account for historically entrenched systems like caste that operate alongside or outside, for example, racialized

frameworks in addressing environmental inequities? A Critical Caste ecologies lens takes on this task by interrogating the neglected subjectivities of caste difference, comprehensively dissecting underemphasized historical and material specifics of caste and its ecological entanglements.

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