

Stealing the common from the goose: The emergence of Farmers' Rights and their implementation in India and Brazil

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Abstract

The emergence of Farmers' Rights in international law is closely related to the “seed wars” at the UN Food and Agriculture Organization (FAO) during the 1980s. Recognizing the plant innovations of farmers everywhere, these rights represented a countervailing measure against increasing pressures to protect commercial plant breeders' rights around the world. Nearly three decades later, the intellectual property rights of plant breeders, internationally recognized and legally binding, are stronger than ever, while Farmers' Rights are facing increasing threats from the continuing spread of industrial agriculture and biotechnologies. The present article seeks to make two contributions: first, embedding the emergence of Farmers' Rights in a historical analysis, it conceptualizes them not simply as a new category of rights, but as a specific manifestation of the conflictual entwinement of capitalism and plant genetic resources fomented in the geopolitical context of the 20th century. Second, focusing on India and Brazil, it analyses the different manner in which the state in both has played a crucial role in restricting the real freedoms of traditional farmers. While farmers' “interests” are routinely preyed upon to justify various policies, their overall effect promises to deepen the ongoing process of farmers' dispossession and separation from their basic means of production: the seed.

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Brazil, capitalist ecology, FAO, Farmers' Rights, India, plant genetic resources

The law locks up the man or woman
Who steals the goose off the common
But leaves the greater villain loose
Who steals the common from the goose.
Anon., 17th century

1 | INTRODUCTION

The first time Farmers' Rights made an appearance in international public law was at the UN Food and Agriculture Organization (FAO) in 1989 in the midst of the so-called “seed wars.” Far from states belatedly recognizing the role traditional smallholder farmers have played in producing plant biodiversity over millennia, the recognition of Farmers' Rights constituted a recent instantiation of a deeper and conflictual entwinement of capital with plant genetic resources in which, as this article argues, states have been implicated since the start. In the immediate FAO context, the symbolic recognition of a limited set of rights for traditional, smallholder farmers served as a *quid pro quo* that made possible the international implementation of the legally binding rights of commercial plant breeders (PBRs). Emerging as a category of private ownership rights in and among a handful of developed countries in 1961, PBRs have spread across the world since then, while Farmers' Rights remain vague: neither the 1989 FAO Resolution¹ nor the subsequent 2001 FAO International Treaty² on plant genetic resources spelled out clearly what Farmers' Rights consisted of, leaving it to national governments to determine their scope and realization.

Farmers' Rights are intrinsically linked to plant genetic resources; although underdefined in the 2001 FAO Treaty, measures states are encouraged to take include the protection of traditional knowledge related to plant genetic diversity, the right to share benefits arising from the utilization of plant genetic resources, and rights to save, use, exchange, and sell farm-saved seeds (Art. 9). The Treaty itself does not define the farmers whose rights it recognizes, but these are broadly understood to be smallholder farmers who primarily use, develop, and conserve seeds³ largely outside the purview of the commercial, proprietary seed sector. For our purposes, the term traditional smallholder farmer will be used without assuming or ascribing uniformity to this analytical category. Its membership is crisscrossed by differences in access to land as much as seed use practices; these farmers may or may not own their land and use commercial and/or traditional, saved seeds, but at the very least they have the ability to choose what to grow. Beyond differences related to land ownership and seed use, the composition of the smallholder farmer category is further complicated by gender, race, ethnic, and caste dimensions, among others. As a result, this highly diverse group displays different, changing, and sometimes contradictory ways⁴ of embracing, negotiating, or contesting the relationship between plant genetic resources (hereafter, PGRs) and capitalism.

Thanks to legal, agrarian, sociologist, anthropologist, and environmentalist contributions from scholarly and activist circles, a small literature on Farmers' Rights has developed over the years that has more recently included studies on how they have been implemented in practice in individual countries or regions (e.g., Andersen, 2005; Jafri, 2018; Peschard, 2014, 2017; Ramanna, 2006; Santilli, 2012). The present article contributes to this literature in two distinctive ways. First, embedding the analysis throughout in an understanding of capitalism as an ecological regime, the article aims to rectify the ahistorical tendency of much of this literature by seeking to reveal something about the submerged part of the “iceberg,” the tip of which is visible in international and domestic instruments related to Farmer's Rights. Drawing partly on Jason W. Moore's “capitalism as world ecology” framework, the first section of the article locates the recognition of Farmer's Rights in the broader transformations and contradictions of

capitalism as an ecological regime. It grounds this abstract framework by focusing on key junctures of the relationship between capitalism and agricultural PGRs, agriculture being the most significant expression of how nature and human organization constitute each other (McMichael, 2007). This complex trajectory is necessarily addressed here schematically, focusing in particular on the post-WWII period when the novel nature-capitalism articulation in the form of petrochemical-hybrid agriculture began to spread globally, thus providing the necessary background for understanding the emergence of the FAO “seed wars” and Farmers’ Rights in the 1980s.

This analysis also provides the basis for the second contribution this article seeks to make: investigating the role the state has played in implementing Farmers’ Rights in India and Brazil.⁵ Attention to the state is necessary not only because it is the agent charged with implementing Farmers’ Rights, but also because, despite observations made about the “hollowing out” of the state during the neoliberal period, it will remain a key actor until its unique socio-spatial location is occupied by another social actor (Hobson, 1997; Jessop, 2002). It is the peculiar structural and spatial features of the modern state that make it one of the central agents in enabling the creation and extraction of value from human and non-human nature; indeed, rarely has capital been able to capture such value without the participation of the state (Parenti, 2015). As will be discussed in Section 2, the particular entwinement of capitalism and PGRs that gave rise to Farmers’ Rights is made possible through the state’s juridico-political powers that produce specific socio-ecological institutional forms enabling value creation and extraction. The state’s technologies in this respect are too many to cover in the context of an article, which is why the focus of both the historical and empirical accounts is on two of the most important ones, namely, the creation of specific techno-scientific and regulatory (especially, property) regimes.

An additional reason for undertaking this second task is to demonstrate how these state technologies are currently being used by two post-colonial states in a manner that perpetuates, albeit in new forms, the destructive capitalism–PGRs dialectic set in motion by colonial states. As Sections 3 and 4 on the issue of Farmers’ Rights in India and Brazil, respectively, show, in their continuous drive to adapt and respond simultaneously to internal and external pressures, these states have played a key role in shaping PGRs’ use domestically and internationally in ways that further enable their subsumption. Focusing on these two states among other potential ones is analytically justifiable on a number of accounts: first, the role and weight of both India and Brazil in international policy regimes is well-established, in large part due to their historical record and their emerging status as “rising powers.” Second, both were and remain actively involved in contests over PGRs, largely on account of the rich—if diminishing—plant biodiversity found within their borders, but also of their considerable ambition to transform their biotech and agricultural sectors into globally competitive ones. Third, they also offer somewhat diverging trajectories on the Farmers’ Rights front: being predominantly an agrarian country dominated by marginal farmers, the Indian state was an early supporter of Farmers’ Rights internationally, while the Brazilian state, priding itself on the international success of its commercial agribusiness, a more ambivalent one. Domestically, however, neither can be praised for empowering smallholder farmers’ development and conservation of PGRs. Although important differences exist between the two states, each is involved in the process of reorganizing PGRs and nature more broadly in the service of value creation and appropriation.

2 | FARMERS’ RIGHTS AND THE DESTRUCTIVE PGRs–CAPITALISM ENTWINEMENT IN HISTORICAL PERSPECTIVE

Plant genetic resources, like other “natural resources,” refer to a specific aspect of nature that has been appropriated for human use. It refers specifically to plant germplasm in which the hereditary material of plant life is contained. A constant feature of human history since the first human communities started domesticating wild plants about 10,000 years ago, the use of PGRs changed radically with the emergence and development of capitalism as a world-historical formation from the long 16th century onwards. It could not have been otherwise, if capitalism is properly understood not merely as having an ecological footprint, but as being an *ecological regime*, that is, a historically

specific matrix of institutional mechanisms seeking to stabilize the flow of food, raw material, energy, and labour to centres of accumulation and production (Moore, 2010, 2017a, 2017b). Capitalism here is not just a force acting upon nature, but a way of organizing nature and a historical formation that develops through the nature–society dialectic (Baglioni & Campling, 2017; Moore, 2010; Smith, 2007). Considerable leaps in capital accumulation have historically occurred under a combination of political power and technological innovations in industry, finance, and agriculture that simultaneously raised productivity and facilitated the appropriation of (human and non-human) nature cheaply or for free: unpaid work by human and non-human natures, nutrients, and energy generated over long geological times in the form of rivers, oil, gas and coal deposits, soils, and forests, as well as other forms of non-human life (Fraser, 2014; Moore, 2010, 2017a).

Notably, while otherwise rich in analytical power and an impressive historical range, this account has not focused specifically on PGRs as a particular articulation of human and non-human nature. The aim of this section is to start addressing this omission by demonstrating how the state in general and, whenever relevant, the (post-) colonial state in India and Brazil in particular has since the start facilitated the destructive capitalism–PGRs relationship through focusing on the two key aforementioned state technologies: regulatory (especially property) regimes and techno-scientific regimes.

Each of the leaps in capitalist accumulation from the long 16th century onwards necessarily restructured and transformed the dynamics of the capitalist ecological regime worldwide. For instance, the “imperial botanic chess game” that started with the Columbian Exchange during which plant germplasm was appropriated from the New World played a key role in underwriting capital accumulation in Europe at the time (Crosby, 1972; Kloppenborg, 2004), and continues to underwrite advanced economies’ success in agricultural markets today.⁶ Moreover, the tropical nature of many PGRs (e.g., sugar, banana, and coffee) determined their lateral move to other colonial possessions where land and labour were cheap or made so through colonial policies (e.g., slavery and land grabs), profoundly transforming them in the process (Crosby, 1972; Mooney, 1983). Of the radical socio-ecological transformations this “botanic chess game” brought about in these territories, the loss of local PGRs and biodiversity is of particular relevance; the immense diversity of tropical and semi-tropical lands colonized by European states was largely eradicated alongside the highly diverse and resilient indigenous agricultural practices so as to make way for single cash-crop plantations (Dawson, 2016, p. 47).⁷

Importantly for our purposes, the appropriation of plant germplasm from the periphery at little or no cost to capital was and remains not only central to the process of accumulation, but also to the process of state formation. State power was and remains central to the creation and appropriation of value. As natural resources circulated across the core-periphery divide, statecraft also developed: modern state’s technologies—military, administrative, judiciary, techno-scientific, and so on—were fermented in the uneven geography of colonialism and empire (Parenti, 2015). Capitalism as an ecological regime has since the start been mediated through the modern territorially defined state and through its geopower technologies (Parenti, 2015, 2016). States have always been spatially Janus-faced, looking both inwards and outwards, and anchored simultaneously in the national and the global terrain, a structural and spatial feature that makes state forms historically specific expressions of domestic and global pressures simultaneously (Hobson, 1997). In its continuous drive to adapt and respond simultaneously to such pressures, the state remains one of the central agents that shapes domestic and international socio-ecological institutional forms (Hobson, 1997; Jessop, 2002). Every era of capitalism has been characterized by a specific regime of geopower that, through such institutional forms, made human and non-human nature accessible, legible, measurable, and useable for the purpose of value creation and appropriation (Harris, 2004; Moore, 2017b; Parenti, 2016).

Despite claims of state’s retreat from the economic sphere in the neoliberal period, critical scholarship always maintained that it was the terms of state’s engagement that had changed; indeed, the unique role of the state in managing the relation between the national and the global often saw it undertake a more interventionist role in creating and securing new opportunities for appropriating value from nature (Jacobsen, 2019; Jessop, 2002). The state is not a unitary entity, and the effects of its various functions and capacities are spatio-temporally contingent; nevertheless, the state’s role in creating and appropriating value from nature remains as central as it ever was (Baglioni &

Campling, 2017). As long as the (capitalist) state retains its control over a specifically defined territory alongside its dual anchorage in the domestic and global terrain, competition in the global market will continue to put pressure on it to deliver human and non-human nature to the accumulation process. If and how this happens vary across time and states; indeed, it is the aim of this contribution to help tease out such dynamics historically and specifically in the context of PGRs use and Farmers' Rights in India and Brazil. Key to understanding these dynamics, as noted, is the use of particular state technologies, namely, the creation of regulatory (including property) regimes and techno-scientific regimes.

Techno-scientific knowledge has been of special importance in identifying, managing, and delivering PGRs' productive capacities into the service of value generation since the beginning of the Columbian Exchange. As part of the geopower technologies deployed by the Spanish, Portuguese, and Dutch states initially, and the British and U.S. states later, botany played a key role in the identification and effective cultivation of "new" plants, creating a knowledge regime institutionalized over time through an imperial network of botanic centres headed by Kew Gardens⁸ in the 19th century and the United States' International Agricultural Research Centres after 1945 (Kloppenburg, 2004). Besides its orientation towards serving the needs of specific capital–state nexus, what was distinctive about this knowledge regime was the manner in which it made invisible the rich knowledge that already existed and was embedded in the dense socio-ecology of indigenous, peasant, and pastoralist communities from where plant germplasm was taken (Gill, 2016). This act of displacement was a foundational act of Western rationality and dominance through which what were vibrant and diverse socio-ecological worlds that had been co-produced by various communities and non-human nature were constituted as wild or idle, available to be put to use through the colonizer's productive rationality (Bhattacharya, 1996; Gill, 2016).

The natural riches of Punjab that the British state claimed to be idle and subsequently turned over to wheat and coffee/tea plantation, for instance, had in fact been co-produced over time by nature and the nomad, agrarian, and indigenous people that inhabited the region (Philip, 2004). Not only were such knowledge and practices crucial to the production of the natural wealth subsequently appropriated, but in many cases superior to the colonizers' productive rationality in its own terms. For instance, while an average "worker-hour" in English agriculture in 1800 yielded about 2,600 calories, the forager and shifting cultivation system of the Mekranoti people in the Brazilian Amazon region centred on manioc, sweet potatoes, and maize yielded as much as 17,600 (Werner, Flowers, Ritter, & Gross, 1979). More importantly, the act of disavowing the socio-ecological co-production of these communities did not entail the complete erasure of the underlying labour practices and embodied knowledges—part of which would be recognized later by Farmers' Rights—but rather their continuous displacement and appropriation: the soil fertility and the rich plant germplasm that had been co-generated underpinned not only capital's original ecological surplus, but also its continuous production each time a particular capitalist socio-ecological configuration was exhausted and later transcended by another capital–state nexus capable of expanding into new frontiers (Gill, 2016; Moore, 2010, 2017b).

The emergence of capital-intensive agriculture as a novel articulation of the nature–society dialectic in the late 19th and early 20th centuries and the subsequent exhaustion of its ability to generate a relative ecological surplus nearly a century later provide a fitting example of these trends and a key moment for elucidating the tensions that gave rise to Farmers' Rights. What set this agricultural evolution apart was not the appropriation of co-produced human and non-human natures for free—a feature of all previous agricultural revolutions—but the particular constellation of (U.S.) state geopower, techno-science, capital, and the property regime that underpinned it. This was a "petrochemical-hybrid" farming model combining new hybrid plants, fertilizers, pesticides, and irrigation schemes—each crystallizing a specific configuration of science, capital, and state power—that achieved an unprecedented yield revolution that would underpin both the U.S. hegemony and the Fordist regime of growth in the developed countries (McMichael, 2007; Moore, 2010).

Crucially for our purpose, the petrochemical-hybrid farming revolution of the 20th century was a key moment in restructuring socio-ecological forms worldwide as far as PGRs were concerned: for the first time, it became possible to separate farmers from their (biological) means of production, the seed (Kloppenburg, 2004). Initially, such separation was made possible in the United States by the technology of hybridization that provided the conditions for

integrating accelerated biological returns from PGRs into the circuits of capital (Boyd, Prudham, & Schurman, 2001). This techno-scientific regime, beneficiary of considerable public funding, was in time supplemented by a state-sanctioned property regime over scientific knowledge of the selection and testing processes, as well as the final hybrids (Dutfield, 2008; Raustiala & Victor, 2004). To enable this new enclosure for hybrids as well as other crops *not* amenable to this technology, the state instituted a new form of (intellectual) property regime—plant breeders' rights (PBRs)—that was later institutionalized in the International Convention for the Protection of New Varieties of Plants (UPOV) signed by a handful of developed countries in 1961 and modified a number of times since then.⁹ The knowledge and practices of smallholder farmers-breeders embodied in the appropriated germplasm were not recognized, but a farmers' "privilege" to use the seeds and other propagating material of protected varieties for non-commercial purposes was initially retained and then severely restricted in subsequent UPOV versions¹⁰ (Dutfield, 2008).

Private property regimes are constitutive of capitalism, and UPOV, an international state-sanctioned regime that for the first time extended intellectual property titles over the appropriated germplasm, has played a key role in enclosing the plant genetic commons. Indeed, the PBRs offered by UPOV became a potent tool in commercial breeders' hands to enter, extend, and protect their share of the global market. The impact of this state-sanctioned property regime, and of the wider agricultural revolution of which it was part, on PGRs use and diversity has been significant: around 75% of PGR diversity was lost during the 20th century as local varieties and landraces were replaced by the genetically uniform, high yielding varieties characteristic of petrochemical-hybrid farming (FAO, 1999). Moreover, what had been a market characterized by thousands of smaller firms became a highly concentrated one where the Big Four—Dow-DuPont, ChemChina-Syngenta, Bayer-Monsanto, and BASF—came to control 60% of global proprietary seed market by 2018 (Howard, 2018).

The U.S. petrochemical-hybrid revolution was an ecological project that inevitably called forth new forms of socio-ecological organization worldwide. Alongside the European agriculture imitating the U.S. one, the spread of the "Green Revolution" in parts of the developing world with the aim of transforming and incorporating their agrarian social formations into the orbit of capital accumulation constituted a key moment in the capitalism–nature dialectic (Kloppenborg, 2004; McMichael, 2007; Patel, 2013). In this process of reconfiguring the human and non-human natures, the state, in its national and international forms, was again central: the state made the Green Revolution, and the Green Revolution remade the state and society in specific ways (Brown, 2020; Patel, 2013, p. 18). Far from being ingenuous victims of the Green Revolution, the aim of developing states that eagerly embraced the Green Revolution was the transformation of their "backward" agriculture into a more capital-intensive mode of production, often as part of their modernization, nation-building, and development strategies of the post-war/decolonization period (Kloppenborg, 2004; Patel, 2007).

Because the decolonization process was mediated by the same international institutions that had earlier facilitated colonization, and because it created new states in the western statehood mould forced to compete in the global market, it is perhaps unsurprising that many post-colonial states would go on to reproduce the core features of the capitalism–nature relation rather than offer alternatives to it. Both India and Brazil are notable in this regard: India for choosing to embrace the Green Revolution in an effort to modernize its agriculture and Brazil for choosing to replicate the U.S. model of state-organized agro-food production, emerging alongside Mexico, Thailand, and others as a New Agricultural Country (NAC) in the 1970s (Friedman, 1993, p. 46). Unlike Brazil, however, India had won its independence on the back of a national liberation movement that, although largely elite-led, did recognize to some extent the socio-ecological claims of peasants and tribal people mobilized at the time (Gadgil & Guha, 1992; Gupta, 1998). Although (e.g., Gandhian) alternatives to the capitalist–nature relation were more or less discarded by the post-colonial state's embrace of development through industrialization as a way of "catching-up" with the West, it was the state's earnest turn to the Green Revolution as a means of increasing the internally appropriated ecological surplus that marked their official abandonment (Gill, 2016). Once again, Punjab's plains were identified as "wasted" and turned over to the scientifically informed high-tech agricultural production of the Green Revolution, initially for internal consumption and, after India's agricultural liberalization in the 1990s, for global markets, too (Patel, 2013).

Despite the nationalist veneer, the drive of the Indian and Brazilian states to imitate the U.S. petrochemical-hybrid model so as to appropriate the ecological surplus internally often materialized in the form of engagement with and dependence on the U.S. state–capital nexus that had control over hybrid plants, technology, and the other inputs (Brown, 2020; Patel, 2013). Importantly, earlier national agricultural policies posed no significant barriers for the continued appropriation of PGRs—and the knowledge and work embodied in them—for free. The international institutional network of the Green Revolution served not only as a mechanism to upend traditional farming methods and the socio-ecological structures in which they were embedded but also as a mechanism of systematizing and deepening the appropriation and transfer of PGRs from these countries to the developed ones (Kloppenburger, 2004). The accelerated collection of PGRs was carried out during this period largely under the supervision of the Consultative Group on International Agricultural Research (CGIAR)—a private-public, donor-led group with weak oversight by FAO—the modern successor of the 18th and 19th century botanical centres network (Kloppenburger, 2004). By the early 1990s, this process had resulted in around 85% of the genetic material thus collected being deposited in the gene banks located in the North (Fowler, 1994, p. 184). Large seed/agrochemical companies also continued to expand their own, private seed banks (ETC Group, 2011).

Neither such banks nor the extension of the petrochemical-hybrid farming across the world, however, have so far eliminated the need for continued access to *in situ* germplasm, the vast majority of which is located in the Global South. On the contrary, agrochemical capitalist agriculture simultaneously necessitates a constant supply of “primitive” germplasm whose genetic variability is necessary for the supply of commercially viable hybrids and directly contributes to the loss of such genetic diversity. This contradictory entwinement of capitalism and PGRs constitutes an important element of the destructive capitalism–nature relation. Genetic erosion occurs not only because once a hybrid (and, more recently, a GM seed) replaces a variety in the field the latter, and its germplasm, is lost, but also because other varieties in the market tend to mimic the commercially successful one. In other words, higher yield varieties tend to eliminate the sources from which they emerge (Wilkes, 1984). But this is only the more recent form of the long and disruptive entanglement between capitalism and PGRs: the more capitalist agricultural forms have expanded, the more PGRs diversity has diminished, leading to the paradoxical situation where current PGRs constitute a poor foundation for the continuation of capitalist agriculture.

What is the relevance of these developments to the emergence of Farmers' Rights? Back in the early 1980s, these dynamics generated a veritable explosive political situation: as it became clear that the expansion of petrochemical farming simultaneously eroded genetic resource diversity and exposed the importance of control over it, many developing countries came under pressure to both guarantee free access to “primitive” PGRs in their territories under the principle of “common heritage of mankind” and to offer private PBRs for “elite” cultivars penetrating their domestic markets (Brand, Görg, Hirsch, & Wissen, 2008; Raustiala & Victor, 2004). Growing tensions over the “gene drain” led to demands in 1981 that FAO prepare a draft international agreement for controlling the flow of PGRs, amid threats of halting germplasm transfer from the South (Brand et al., 2008; Petit, Fowler, Collins, Correa, & Thornström, 2001). The “seed wars” began, and the stage for the emergence of Farmers' Rights was set.

A momentary truce during the “seed wars” came in the form of the 1983 International Undertaking on Plant Genetic Resources¹¹ that made no mention of Farmers' Rights. Although voluntary, the undertaking constituted a symbolic victory for many developing countries involved who managed to expand the notion of “common heritage” to include “elite” cultivar lines, with a view to better and cheaper access to the latter (Mooney, 1983; Rajan, 1994). As a NAC country, Brazil did not support the undertaking, joining the ranks of the United States, Canada, and other developed countries with strong seed and agrochemical sectors that refused to adhere to it (Rajan, 1994). The “seed wars” resumed and, in hindsight, only abated when three resolutions were agreed over the interpretation of the FAO Undertaking in 1989 and 1991,¹² in which all states, including developing ones, simultaneously recognized sovereign rights over genetic resources within their territories and PBRs (Raustiala & Victor, 2004). Farmers' Rights, developed initially by Pat Mooney and Cary Fowler in the early 1980s, were thrown in the mix during the interim Keystone Dialogues as a means of countering resistance to PBRs (Andersen, 2005; Rajan, 1994).

Alongside the nominal recognition of Farmers' Rights, many developing countries insisted during the FAO negotiations on the principle of state ownership over genetic resources and, importantly, that compensation had to be paid for their use. In less than a decade, they had abandoned the "common heritage" principle and moved decisively towards expanding state ownership rights over genetic resources, this being an essential first step towards the PGRs' valorization (Brand & Görg, 2013). This should be understood in the context of wider transformations during the 1970s and 1980s that ushered in a more intensive regime of valorization and competition in world markets, prompting many developing states to see the biodiversity within their territories as a resource whose utilization would enhance their income/rent and as a key component of their growth regimes (Brand, Görg, Hirsch, & Wissen, 2008; Muzaka, 2017). This was certainly the case for India and Brazil. Rich in biodiversity and having invested early on in traditional biology, both states were acutely aware of the potential the new biotechnologies of the 1980s offered in appropriating larger shares of the ecological surplus and propelling their economies forward. Indeed, the Indian state included biotech as a new priority area in its sixth Five Year Plan (1980–1985), and the Brazilian state did the same in its Programme for Scientific and Technological Development during the 1985–1995 period (Rajan, 1994; Schwartzman, 1995). The commitment of each state to making their own biotech sectors globally competitive and better capable of converting genetic resources into wealth has only strengthened since then (Muzaka, 2017).

Importantly, states were using their juridico-political powers to expand their ownership claims over PGRs as commodities not only at FAO but also in other international regulatory regimes, especially in negotiations over what became the Convention on Biodiversity (CBD) and the WTO TRIPS,¹³ in 1993 and 1995, respectively. Understanding developments in these other international state-sanctioned regulatory regimes is central to the trajectory of Farmers' Rights from the early 1990s onwards. Neither of the two legally binding agreements mentioned "common heritage" or Farmers' Rights, but they recognized PBRs and other forms of intellectual property titles. The CBD, establishing a new property domain over genetic resources ruled by state sovereignty, acknowledged the contribution of farmer and indigenous communities to the generation of biodiversity in general and PGRs in particular (Brand, Görg, Hirsch, & Wissen, 2008; Petit et al., 2001). Nevertheless, such recognition was severely limited; in line with the primacy the CBD accords to PGRs' economic utility over their preservation, recognition was circumscribed to practices relevant to the sustainable use of biodiversity (Brand & Görg, 2013). Moreover, whatever benefits were to accrue to these communities were to be apportioned from rewards claimed by those whose rights over genetic resources the CBD recognizes: states and private companies in the business of manipulating genetic material (Brand & Görg, 2013; Kloppenburg, 2004).

With TRIPS establishing a global IP regime that included PBRs and with ownership rights over genetic resources firmly established in state hands in the early 1990s, the issue of Farmers' Rights was superseded even amidst its early state supporters by concerns over benefit-sharing from the use of genetic resources. Led by India and Brazil, efforts towards implementing a fair system for sharing PGRs' use benefits continue to this day in various international fora. What is often missed amid the cacophony of calls for fairness or protection from new forms of colonialism/biopiracy is the extent to which the very state actors making such calls are competing with each other to "sell" their PGRs on their own terms to units of capital capable of converting them into wealth (Muzaka & Serrano, 2019). Whatever victory the principle of benefit-sharing might have scored in the long history of the "botanic chess game," it certainly signalled the point in time when the unity of developing countries rich in biodiversity was broken as each scrambled, under the intensified pressures of global competition and valorization logic characteristic of the neoliberal period, to outcompete the others in enhancing their share of appropriated ecological surplus. These dynamics are often hidden under a strong nationalist discourse that depicts (the Indian and the Brazilian) states as the protectors of national genetic resources from new forms of bio-colonialism. This is part of a discursive technology that states often deploy to boost their legitimacy through incorporating certain elements of popular discontent, for instance, resentment over biopiracy, while the material conditions that gave rise to such discontent are not addressed or only partially so (Chacko, 2018; Garfield, 2013; Randeria, 2007).

Because such state technologies foreclose effective forms of solidarity, today there is neither a strong coalition for, nor a strong commitment to Farmers' Rights by states at the international level. It is not clear what would have

become of Farmers' Rights had it not been for states during the CBD negotiations failing to agree on the issue of agricultural PGRs and putting back the ball on FAO's court (Petit et al., 2001). The 2001 FAO International Treaty on Plant Genetic Resources for Food and Agriculture¹⁴ a decade later was notable primarily for constituting a multilateral system of facilitated access to a number of key agri-PGRs and for the contradictory manner in which it enshrined Farmers' Rights. It fully recognized the responsibility of the international community towards these rights in the preamble, but it devolved the responsibility for their realization to member-states in accordance with their needs, priorities, and national laws (Art. 9). Farmers' entitlement to a part of benefit-sharing arrangements, the right to participate in decision-making regarding PGRs, and the freedom to save, use, and sell farm seeds were provided as *guidelines* regarding the possible but not obligatory scope of Farmers' Rights (Andersen, 2005). The Treaty itself neither impedes the dispossession of farmers of the PGRs they have historically enriched nor provides any effective material recompense to them. In effect, Farmers' Rights in the legally binding 2001 FAO Treaty are legally binding neither for the international community nor for the signatory states who were effectively told they had the right to make—or not—their own laws.

If the growth of seed activism worldwide during the last two decades is anything to go by (Peschard & Randeria, 2020), both the 2001 FAO Treaty and state regulatory regimes on Farmers' Rights have been found severely wanting. In what amounts to international public law-making by transnational agrarian movements, the 2018 UN Declaration on the Rights of Peasants¹⁵ provides an alternative framework that places the collective rights of local communities to natural resources—including, but not limited to PGRs—over private property rights (Haugen, 2020). The much broader recognition of peasant, nomad, pastoralist, and other rural worker's rights in the declaration is coupled with a wider array of state obligations; nevertheless, being a non-binding agreement whose implementation is yet to be discussed, it is unclear how it will affect the capitalism–PGRs dialectic in the near future. For now, as a new expansion of the relative ecological surplus becomes increasingly more urgent, states everywhere are deeply involved in reworking and controlling nature at a genetic level. This is certainly the case in India and Brazil, as the following sections demonstrate.

Housing a considerable proportion of the remaining agricultural biodiversity,¹⁶ the pressure to expand the relative ecological surplus has implications for the domestic trajectory of Farmers' Rights in India and Brazil. But any argument that these states will ignore such rights altogether is facile. This is so, first, because the orientation towards further PGR commodification generates internal contests with which states have to deal if they are to retain social cohesion. The outcomes of these contests cannot be determined a priori; as will see shortly, although both the Indian and the Brazilian states have moved to further increase PGRs' appropriation, their specific strategies inevitably bear the imprints of domestic contests. Second, states also have to deal with the tensions emanating from the contradictory capital-PGRs entwinement. Especially as the Indian and the Brazilian states have staked their growth regimes in part on valorizing their biodiversity, they will likely attempt, or be seen to attempt, to somehow maintain the conditions that contribute to the long-term preservation of biodiversity, while simultaneously subjugate it to the short-term appropriation of ecological surplus. How individual states deal with Farmers' Rights, in other words, is contextually and historically specific and contingent on how they manage to deal with these broader contradictory pulls.

3 | THE STATE AND FARMERS' RIGHTS IN INDIA

The manner in which the capitalism–PGRs relationship has manifested itself in India recently cannot be understood without reference to the wider issues of control over the appropriation and circulation of ecological surplus since India's independence. As noted earlier, the post-colonial state's adoption of the “catching-up with the West” development mantra offered not an alternative to the ecological regime of capitalism but rather its continuation through the re-mobilization of colonizer's strategies for the appropriation of the ecological surplus, now being consumed primarily internally (Gill, 2016; Gupta, 1998). Such continuity is visible, for instance, in how the land reforms initiated immediately post-independence removed only certain elements of the colonial system, most notably the

redistribution of absentee (zamindari) landlords' lands to the middle peasantry (Brown, 2020; Guha, 2007). Not only did such reforms of the land property regime not benefit the poorer peasants and especially forest dwellers and indigenous inhabitants, but further displaced them and their knowledge and labour practices either to make way for large scale projects, or through distributing their lands to settled cultivators deemed better capable of delivering the needed ecological surplus (Gadgil & Guha, 1992; Gill, 2016; Guha, 2007). In addition to changes to the (land) property regime, and despite the anti-colonial movement blaming colonial science for stifling local knowledge, the early post-colonial state embraced Western science and technology as central to its catch-up strategy (Chatterjee, 1993).

The espousal of this techno-scientific regime had important implications for agriculture and PGRs use: for instance, following the adoption of the Green Revolution in the 1960s and the centralization of agricultural research under the auspices of ICAR,¹⁷ central state investment in R&D focused predominantly on a small number of crops cultivated in areas transformed in line with the demands of petrochemical-hybrid farming (Brown, 2020; Raina, Joseph, Haribabu, & Kumar, 2010). Exclusively concerned with enhancing the productivity of single crops (especially wheat and rice) through technology-intensive agricultural inputs, the Green Revolution and the institutional reforms undertaken to enable it had the effect of exacerbating the marginalization of traditional agro-ecological methods of poly-cropping, water saving, and seed selection and exchange (Gill, 2016). The effects of this continued post-/colonial subsumption of nature on plant biodiversity has been formidable: to make but one example, from an estimated 400,000 varieties of rice cultivated in India before the onset of colonialism, around 6,000 are left, with over 75% of the rice land using only 10 varieties today (Wang, Upadhyaya, & Dweikat, 2016, p. 231).

Despite being touted as an undisputable success, the Green Revolution did not uniformly transform socio-ecological forms across India. On the contrary, it left on its wake a sector that is highly diverse and where ecological surplus is largely concentrated in the hands of better-off capitalist farmers and certain states (Jacobsen, 2018, 2019). One outcome of the (uneven) Green Revolution, further exacerbated by the gradual liberalization of agricultural sector from the 1990s onwards, has been the precariousness of India's smallholder farmers and peasants: today, 7% of rural households control 47% of total land area, whereas the remaining 93%—a very large number of people—have either no land or only marginal holdings that are often economically unviable (Nielsen, 2018; Raina et al., 2010; Ramanna, 2006).¹⁸

Although the Indian state only gradually and selectively liberalized agriculture, and although it retained a number of protective measures that have been rearranged in ever more complex ways, its orientation since the late 1980s has been towards a mode of petrochemical agriculture tightly integrated in world markets (Brown, 2020; Jacobsen, 2019). In the absence of any real support for smallholder farming, and most existing state support aimed towards "superior" petrochemical farming methods that are deemed necessary for making the agricultural sector globally competitive, many smallholding farmers have been pushed towards adopting input-intensive agricultural methods they can ill-afford (Jacobsen, 2019; Reddy & Mishra, 2009). This helps explain to some extent the indebtedness and impoverishment of a large number of Indian farmers—the worst consequences of which are visible in over 300,000 farmers' suicides since 1995 (Safi, 2017)—but, because their adoption of petrofarming practices in large numbers has lent legitimacy to the state's orientation towards this form of agriculture (Brown, 2020; Jacobsen, 2018), it is difficult to speak of India's smallholder farmers as being generally opposed to the commodification of PGRs and nature more generally.

This said, despite the state's embrace of the Western, ecologically destructive capitalist growth model and the associated techno-scientific regimes, alternative versions of the nature–society relationship survived and continued to express themselves in ever-changing forms of resistance against the state in its post-colonial form (Cederlöf & Sivaramakrishnan, 2006). The most relevant point for our purposes relates to how environmental—although not farmers¹⁹—protests towards protecting biodiversity both from the ecologically disastrous effects of industrialization and from neo-colonial misappropriation/biopiracy from the 1970s onwards were partly absorbed into the Indian state's efforts of recasting nature in the service of capitalist development in the new growth regime it adopted from the late 1980s onwards (Muzaka, 2017). This was a growth regime based on a strengthened capitalist valorization logic and on a vision of transforming India into a globally competitive economy (Alamgir, 2009; Nayar, 2000;

Rajan, 2006). Outwardly, this vision manifested itself in a defensive-assertive state strategy with regard to PGRs from the late 1980s onwards, aimed simultaneously at resisting acts of biopiracy fuelled by a nationalist indignation against neo-colonial expropriation and at making India a competitive player in global agricultural and biotech markets (Rajan, 2006; Scoones, 2005). It characterized the Indian state's participation in negotiations over PGRs in key international fora: for instance, India insisted at the CBD negotiations on both moving towards a property regime founded on the principle of national sovereignty over genetic resources and on making access to them conditional upon the transfer of biotechnologies developed in frontier economies so as to support India's nascent modern biotech sector (Rajan, 1994).

The development of a competitive biotech sector capable of generating a higher ecological surplus became a key part of India's new growth strategy from the 1990s onwards; indeed, biotech is heralded to this day by policymakers of various political persuasions as a powerful enabling technology that will not only revolutionize India's agriculture but also help establish India as a knowledge superpower in the world (Gol, 2007; Muzaka, 2017; Scoones, 2005). In light of this new growth regime, and although it offered support to Farmers' Rights at the FAO, Indian state's actions at home have been less preoccupied with their realization than with controlling PGRs and enhancing the share of the appropriated ecological surplus vis-à-vis other players in the global market. This orientation can be seen, for instance, in its highly publicized challenges of patents issued by the U.S. patent office on turmeric and basmati rice; while its success in revoking or partly limiting these patents (in 1997 and 2001, respectively) certainly helped boost its credentials as the protector of national genetic resources at home, the Indian state fought these cases exclusively on issues of interest to Indian exporters rather than of the multitudinous farmers dependent on such crops who saw no benefits from the legal challenges (Randeria, 2007).

More broadly, the Indian state's strategy of navigating the domestic and global pressures regarding PGRs use and Farmers' Rights has to be located in its ongoing attempts to expand the ecological surplus through promoting a Second Green/Gene Revolution tightly articulated in global agricultural markets (Bajpai, 2015; Scoones, 2005). This orientation becomes clear when observing how the Indian state has shaped particular techno-scientific and regulatory regimes relevant to Farmers' Rights and PGRs use. A decade-long process of consultations and civil society activism on what became India's Biodiversity Act of 2002, for instance, succeeded in enshrining a three-tier structure that gave local communities a role to play in biodiversity management; nevertheless, the act made no mention of Farmers' Rights, rejecting the many submissions highlighting the significance of biological diversity for the sustenance of the livelihoods of the vast majority of the rural population (Randeria, 2007). After this act, the state moved to control genetic resources and access to them under a centralized state agency, the National Biodiversity Board, at the expense of involving local communities; indeed, of over 300 cases approved by the board by the end of the first decade, no cases of benefit-sharing with local communities had been concluded (Kohli, Fareedi, & Shalini Bhutani, 2009). The 2002 Biodiversity Act only polices access to PGRs on the part of foreigners, confirming that the concern of the state is not the appropriation of genetic resources as such, but rather its beneficiaries (Krishnaswamy, 2011). This is why, for instance, although traditional knowledge in general and that related to PGRs in particular is non-patentable in India, many such patents have been granted, especially to state laboratories (Dutz, 2007).

Notable in the vision of India becoming a competitive market economy are not only state efforts towards creating the regulatory regimes needed for enabling the continued extraction of value from PGRs but also the emergence of the Indian state itself as an aspiring start-up in the global bio-technoscientific terrain (Rajan, 2006). Setting up appropriate property regimes, investing in biotech R&D and high-tech clusters are part of the picture, as is the fact that the market agents that have made the most of India's commodification of biodiversity and associated traditional knowledge are state agencies and public laboratories (Mueller, 2008; Muzaka, 2017). This is partly why the state has been deeply involved in contests with multiple groups over the control, access, and use of genetic resources and traditional and scientific knowledge since the late 1980s, appearing sometimes as a "hero" or a "villain," depending on the issue at hand, the specific parts of the state involved, and the manner in which it has sought to play off domestic and global pressures against each other (Muzaka, 2017; Rajan, 2006; Randeria, 2007).

This has certainly been the case with implementing Farmers' Rights. Appearing as their supporter in international fora, the Indian state has limited considerably their scope away from any association with broader socio-economic rights or biodiversity preservation domestically. The 2002 Biodiversity Act, as noted, adopted CBD's primacy of utilization over preservation of genetic resources and of state property rights over them, excluding the many communities that have traditionally produced and protected PGRs in India. Civil society mobilization—although largely elite-led—was more successful in what became the 2001 Protection of Plant Varieties and Farmers' Rights Act.²⁰ Indeed, it is quite unlikely that what had started predominantly as an exercise in providing PBRs as *per* TRIPS requirements would include any Farmers' Rights provisions had it not been for the political mobilization of civil society groups and divisions (especially between the Ministry of Environment and Forests, Ministry of Agriculture, and the Department of Biotechnology) within the government (Peschard, 2014; Ramanna, 2006). This act was one of several progressive legislative manoeuvres²¹ undertaken by the state during the 2000s in an attempt to neutralize political instability unleashed by agricultural liberalization while simultaneously shoring up grassroot consent for the new growth regime squarely based on the expansion of ecological surplus (Brown, 2020; Chacko, 2018; Jacobsen, 2019). Notably, radical proposals to deal with the agrarian crisis, including government's own 2006 National Commission on Farmers that proposed among other things radical land reforms, the strengthening of common property resource, and the promotion of conservation farming and biodiversity, have been completely ignored (Ghosh, 2018).

Against this background, it is perhaps unsurprising that of the two most prominent views that preceded the 2001 Farmers' Rights Act—Farmers' Rights as a form of intellectual property right or as a developmental right—the latter was sidelined (Ramanna, 2006; Ranjan, 2009). This was not an impediment to the act being widely lauded as the most progressive in the world as far as Farmers' Rights were concerned. It does indeed boast a number of important rights: it not only safeguards the right of farmers to save, use, exchange, and sell seeds—no doubt a fundamental right where nearly 80% of farmers rely on farm-saved seed (Jacobsen, 2019)—but also other rights, such as the right to register their own plant varieties as commercial breeders do,²² the right to information about expected yields from commercial varieties and compensation in case of non-performance, and provisions for benefit-sharing when farmer varieties contribute to successful commercial plant varieties. In practice, around 1,500 farmers' varieties have been registered to date, but as benefit-sharing provisions are entirely reliant on commercial or public breeders declaring the use of farmer varieties, farmers are yet to see any material benefit from their rights over PGRs, suggesting that the act supports farmers' varieties primarily as a means of contributing to the development of "elite" cultivars (Jafri, 2018; Peschard, 2017).

In line with the state's aim of commodifying India's genetic resources, the act essentially created a property regime that lured farmers in as equal participants—a point that the seed industry agitating for private PBRs protection understood well—despite the deep asymmetries between India's smallholder farmers and its commercial and public plant breeders (Ramanna, 2006; Ranjan, 2009). Indeed, public plant breeders have registered a large number of varieties under the act, but this testifies neither to their provision of a public good nor to their position in the domestic seed market. Both have been progressively relinquished since the 1980s in line with the state's goal of creating globally competitive Indian biotech and agricultural sectors; measures taken to enhance private sector's participation in seed production and distribution have resulted in it controlling nearly 80% of turnover in the formal seed market in 2010 (Jacobsen, 2019; Manjunatha, Rao, Dastagiri, Sharma, & Burman, 2016, p. 74). As this sector has grown on the back of significant accumulation opportunities afforded by the existence of a large informal seed market, so have its demands for better state-sanctioned plant variety and intellectual property protection regimes (Jafri, 2018). The Indian state, in its continued commitment to the capitalist valorization logic, has obliged: soon after the 2001 Farmers' Rights Act, a Seeds Bill was proposed in 2004 purportedly with the aim of regulating the quality of seeds and curbing the sale of poor quality seeds, but in reality providing the conditions for the further expansion of the private seed and agribusiness markets (Ramanna, 2006). Civil society groups involved in the various reiterations of the Bill from 2004 onwards argue that, despite various amendments, it ultimately strengthens the hand of private seed companies and limits Farmers' Rights through, for instance, forcing them to buy seeds in the formal market, limiting their informal practices by requesting them to register seeds for sale, removing benefit-sharing provisions and

safeguards related to innocent infringement, and removing price controls in the seed market (Jafri, 2018; Peschard, 2014). With efforts to revive the notorious bill renewed again in 2019²³—and despite the state's continued promises to improve the lot of Indian farmers—the future of Farmers' Rights in India remains uncertain.

4 | THE STATE AND FARMERS' RIGHTS IN BRAZIL

The embedding of the political imaginary of the Brazilian nation in nature has been strong, partly because of its long-standing image as an exuberant land of natural riches, and partly because nation-state building efforts post-independence appealed forcefully to them as the guarantee of the national greatness that was to come (Carvalho, 2000). Far from being Edenic, the nature thus invoked had not only been co-produced by the different peoples whose existence the post-independence nation-builders intentionally sought to obfuscate, but it had also been drawn into the ecologically destructive dynamics of capitalism since the Iberian conquest. The vast ecological surplus appropriated during this period resulted in significant socio-ecological transformations, wiping out unquantifiable levels of biodiversity and ecosystems in the process; to make but two key examples, it resulted in the almost total replacement of the *Mata Atlântica*—the tropical forest that once covered the entire Brazilian coast—with sugarcane, coffee, and later soy plantations that arrived through the circuitous routes of the imperial botanic game, and in significant inroads into *Amazônia*, still the most important national symbol today (Garfield, 2013). Partly because of the way Brazil's independence was secured in 1822, the colonial socio-ecological structures persisted more or less intact, as did the colonial strategies for the appropriation of ecological surplus, although now ostensibly to benefit the new nation (Furtado, 1992). Indeed, processes of “internal colonization” perpetuated colonial structures, enabling the extraction of ecological surplus for at least another 100 years after independence; the most important of these structures were perhaps extreme land (and wealth) concentration and monoculture production—sugarcane and coffee in particular—aimed at international markets (Barbosa & Gonçalves, 2014; Furtado, 1992).

What changed regarding the appropriation of ecological surplus from the early 1930s onwards was its use to finance the new “catch-up” strategy through industrialization that the Brazilian state adopted in earnest then and especially after WWII. Its success on this front—the share of industry reached a relatively impressive 44% of the GDP in 1980—would have been impossible without such appropriation on a large scale (Grinberg, 2008). The gradual decline of what was then the agricultural frontier expansion, and the adoption on the part of the military government of an internationalist model of development in the mid-1960s, led among other things to a number of measures aimed at increasing the productivity and export capacity of Brazil's agricultural sector, the most important of which were state-sponsored infrastructure projects, generous credit lines/subsidies and the creation of a centralized, public agricultural research network focused mainly on commercially successful crops/hybrids under the auspices of Embrapa²⁴ (Mueller & Mueller, 2014; Nehring, 2016). These state-sanctioned regimes, consciously replicating the United States' petrochemical-hybrid model of capital-intensive agriculture and directly supported by the agricultural U.S. state-science nexus, not only set the stage for Brazil emerging as one of the most important NACs in the 1970s and 1980s (Friedman, 1993) but also for its undisputable position as a major agricultural power today. Indeed, agriculture as a percentage of GDP doubled from around 15% to 30% from 1975 to 2012 (Nehring, 2016, p. 11), based predominantly on large-scale monocrop production and trade of processed agricultural goods (e.g., “flex crops” like soy, sugarcane, and maize but also chicken and cattle meat) dominating the global markets. Although seemingly at odds with the declared state aim of making Brazil “the great technological and environmental power of the 21st century” (Lula [Luiz Inácio da Silva], 2007), the expansion of ecological surplus is, as in India, central to Brazil's current growth strategy (Muzaka, 2017).

And, as in India, smallholder farmers in Brazil have felt the most the pressures of this orientation. This is a diverse group of farmers that, depending on the definition, includes family farmers, agrarian reform settlers, indigenous peoples, and other traditional people (e.g., Quilombola, rubber-tappers, and forest gatherers), all of whom have different kind of relations to petrochemical-hybrid farming and PGRs use. Those resisting the further commodification of

PGRs have clashed with state's aim of controlling and utilizing Brazil's PGR diversity as part of its growth strategy underpinned by deepening ecological appropriation and competitive insertion in global markets. State efforts to convert Amazon's biodiversity into a source of value and techno-scientific knowledge, for instance, met since the early 1990s with resistance from indigenous and traditional communities on account of lack of consultation and, for many, traditions incompatible with the idea of PGRs' commodification (Eimer, Lütz, & Schueren, 2016). Although all state agencies agreed that genetic resources should be utilized towards value extraction, the degree of communities' involvement was strongly disputed; this turf war might have continued were it not for the president issuing a Provisional Measure in 2000 which, riding on waves of biopiracy fears,²⁵ effectively implemented the CBD and, through numerous latter resolutions, placed control over access to genetic resources in state's hands (Coutinho, Silva, & Marin, 2001; Eimer, Lütz, & Schueren, 2016).

More broadly, and despite a number of policies in the 2000s to support smallholder farming, the state's substantial and continued support for the agri-business sector and the global success of the latter has worsened smallholder farmers' fortunes: the average price per hectare of crop land increased by 430% in the 1994–2010 period, for instance, unleashing land grabbing and dispossession at an unprecedented scale (Sauer & Leite, 2012). The "success" of Brazil's agribusiness sector brought no visible benefits to Brazil's smallholder farmers or changes to land concentration: recognized as a problem that required an expeditious solution as early as the 1946 Constitution, redistributive land reforms have been part of all governments' programmes, all of which have more or less failed (Martins, 2006; Sauer & Leite, 2012). Land concentration in Brazil reveals both the state's management of the land property regime and patterns of ecological surplus' appropriation: under 1% of farms produce over 50% of gross agricultural income and occupy more than 43% of the total area today, while farms of less than 10 ha account for nearly half the number of farms but for only around 3% of the total area, not to mention over 3 million families classed as landless (Mueller & Mueller, 2014, p. 15; Sauer & Leite, 2012, p. 876).

A particularly revealing instance of the Brazilian state using its juridico-political powers to subsume nature/PGRs to the imperative of ecological surplus' extraction and appropriation at the expense of other socio-ecological forms comes from the conquering of Brazil's hinterland that opened up more than 100 million hectares from the *cerrado* region in the west deep into the Amazonian and northeastern regions (Wilkinson & Herrera, 2010). Often depicted as a techno-scientific achievement on the part of Embrapa in adapting soy and other crops to this particular environment, the conquest was achieved by the Brazilian state–capital–science nexus in collaboration with the U.S. one (Nehring, 2016). Notably, the addition of this "new"²⁶ land not only did nothing to rectify the issue of land concentration and marginalization of smallholder farmers but made it worse. From the very beginning, no alternatives to the petrochemical-hybrid colonization of this area were ever entertained, and its design was both aimed at the international markets and dependent on it for inputs to maintain productivity; indeed, the *cerrado* is the most input-dependent agricultural zone in Brazil (Nehring, 2016; Rada, 2013). Meanwhile, long-standing local agricultural practices and forms of life based on local crops and methods of counteracting soil acidity were not only ignored but in time eradicated as large-scale (predominantly soy) agri-industrial farms took over, helped in no small measure by state-sanctioned regimes such as generous credit lines and settlement deals for industrial farmers from the South (Nehring, 2016).

The success of the Brazilian state's technologies to reproduce the destructive entwinement of capitalism and nature and help increase the share of ecological surplus appropriated in global agricultural markets is undisputable: unlike India, the agricultural share of GDP has increased and in 2017 generated a historical surplus of over US\$81 billion (FAO, 2018). But this has come at a considerable cost both to the smallholder farm sector and to PGR biodiversity (McKay & Nehring, 2014). Relying exclusively on extensive, industrial-scale monocropping in existing and newly conquered lands in the *cerrado* and the Amazon has significantly reduced biodiversity; ironically, the country that hosted the CBD is now the world's largest consumer of pesticides and the second largest producer of GM crops (Clive, 2011). The current Bolsonaro government appears intent on breaking this record and on further intensifying the ever-growing rate of ecological surplus extraction (Soubrinho, 2019).

This orientation, in turn, has increased tensions on the ground; the more the state has supported the expansion of industrial agriculture, the more tensions in the smallholder farming sector have increased. Some of these tensions

emerged over the new seed and PBRs legislation contemplated during the 1990s. Brazilian seed laws developed from the 1970s onwards were part of the wider industrial agriculture strategy; not only was their intent that the formal, commercial seed system would eventually replace the “inferior” informal traditional farmers' system, but they completely disregarded traditional farmers' knowledge and capacities as seed breeders (Santilli, 2012). This said, support for UPOV and PBRs was not particularly strong; until the early 1990s, Embrapa and other public research institutes had opposed PBRs on grounds that agricultural R&D ought to remain in the public domain and out of fear that their introduction would facilitate the takeover of the domestic sector by foreign companies (Filomeno, 2014). In the wake of the new growth regime predicated in part on Brazil's competitive strengths in agriculture and biotech sectors from the early 1990s onwards, Embrapa embraced the imperative of obtaining profits from the exploitation of its research outcomes, a change that was instrumental in shaping what became the 1997 Law of Protection of Cultivars (Lei no. 9456) (Filomeno, 2014; Peschard, 2014). Having lost the support of the largest holder of cultivars and the largest agricultural research institute in the country, resistance against the bill on the part of CONTAG (the National Confederation of Rural Workers) and the MST (the Rural Landless Workers movement) weakened; a provision on farmers' right to save as well as exchange and sell seeds to other small farmers was added by the Senate but promptly removed by the Chamber, although the final text, being largely based on UPOV 1978, did incorporate the right of rural producers to save seeds (Filomeno, 2014).

Nevertheless, reforms of various state regulatory regimes undertaken from the mid-1990s onwards so as to accommodate the new growth strategy have done little to implement Farmers' Rights and whatever elements of the latter they contain has been the result of formidable political mobilization by civil society and agroecology groups (Muzaka, 2017; Peschard, 2017). One of the most notable successes of such mobilization was the recognition of local varieties developed and cultivated by small-scale farmers, as well as their right to save part of their production for future replanting in the revised Seed Act of 2003 (Santilli, 2012). It was a success because while the 1997 Plant Variety Protection Act recognized the right to save seeds under certain circumstance, it emphatically did not recognize small farmers as breeders. Nevertheless, the victory scored in the 2003 Seed Act was a limited one: the definition of local varieties remains legally unclear and it placed several restrictions on quantity, season and place of replanting “own seeds,” restrictions which multiplied further in the 2004 decree that implemented the Act (Peschard, 2017; Santilli, 2012).

One key reason why Brazil has no specific Farmers' Rights regime and whatever limited rights are afforded to smallholder farmers are subordinated to commercial breeding and agribusiness interests, as noted, is to be found in the state's orientation towards the competitiveness of its agribusiness and biotech sectors in global markets. Indeed, three key parts of the state—the Executive, the Ministry of Agriculture, and Embrapa—have played a direct role in limiting Farmers' Rights. In line with the new state orientation, Embrapa emerged as a major owner of IP/PBRs and a key player in the seed and agro-biotech market; as the first decade of the 2000s was ending, it alone owned 27% of protected cultivars in the Brazilian formal seed market and nearly 41% of the total when its partnerships were included (Chamas et al., 2007; Filomeno, 2014, p. 85). Having become a major commercial player, this public institution would play a central role in restricting the right to save seed in the 2003 Seeds Law and, more broadly, in limiting the role that the informal seed system—still serving the majority of smallholder farmers in Brazil—and farmers' innovation play in agro-biodiversity (Santilli, 2012).

In 2002 and 2009, the Ministry of Agriculture that has traditionally represented the interests of agribusiness and large landowners, supported by Embrapa, also sought to amend the 1997 Plant Variety Protection Act in order to make it more generous to PBRs-holders using arguments about the need to encourage R&D investment, fight against seed piracy and help make Brazil a leader in agro-biotech (Filomeno, 2014). No less than three bills, one originating from the executive, were under review in 2012, once again aiming to expand the rights afforded to commercial PBR-holders by the 1997 Act and restricting even further seed-saving practices of smallholder farmers (Peschard, 2017). These bills have so far displayed a tendency of falling off the agenda only to reappear in more restrictive versions later: the Ministry of Agriculture and the Executive were still working towards a new seed act in 2014 and a new PBR bill that appeared in Congress a year later was still being considered in 2018.²⁷ Both bills raise concerns about

the viability of Farmers' Rights legislation and implementation in Brazil, made worse by the growing power of the *bancada ruralista*²⁸ in Congress and the downgrading of the Ministry of Agrarian Development—perhaps the only, if weak, ministry supporting small-scale farming—to a mere secretariat in 2016. The strong orientation of the current Bolsonaro government towards an even more intense appropriation of value from nature does not bode well for the future of Farmers' Rights in Brazil.

5 | SOME CONCLUDING THOUGHTS

As the analysis on Farmers' Rights and their trajectory in India and Brazil has attempted to show, their emergence is best understood as the specific manifestation of a longer, deeper, and conflictual entwinement of capitalism and PGRs. Understanding capitalism as an ecological regime that strives to simultaneously appropriate human and non-human natures and overcome opposition to this appropriation helps explain why Farmers' Rights emerged and developed in the form they did from the 1980s onwards. This is the period in time when the ability of petrochemical-hybrid farming revolution of the 20th century to generate a relative ecological surplus was boosted to some extent by the development of biotechnologies that expanded the ecological frontier by opening up new spaces of valorization at plants' genetic level. The real subsumption of PGRs and nature from this moment on has been accompanied by increased pressures on the remaining commons and areas of undercapitalized nature, especially on peasant and smallholder farming communities where most of the world's agrobiodiversity currently resides. Although Farmers' Rights recognize in principle the role of these communities in producing and protecting PGRs, in practice, they have been unable to counter such pressures, not least because the actor in charge of implementing Farmers' Rights—the state—is the same actor that, compelled by the exigencies of the more intensive regime of valorization and competition in world markets since the 1980s, has often acted to restrict such rights in practice.

Although in different ways, the rights of smallholder farmers in both India and Brazil have increasingly come into conflict with these states' orientation towards developing agricultural and biotech sectors capable of succeeding in global markets. This said, despite the fact that this orientation has so far manifested itself in increased pressures to divest smallholder farmers of their means of production in general and PGRs in particular, the state in both cases has engaged in efforts to temper the worse effect of this form of accumulation. This has been more clearly the case in India, which has a large population of smallholder and precarious farmers; both in India and Brazil, however, the state has attempted with different degrees of success to neutralize and disaggregate opposition to its orientation by incorporating some of its demands into various state-sanctioned regimes (Brown, 2020; Chatterjee, 2008; Jacobsen, 2019; Nielsen, 2018). While in the case of Farmers' Rights, as we have seen, they have by and large not improved smallholder farmers' existence, these seemingly "progressive" measures have provided support for the continued expansion of the ecological surplus. Neither the current analysis, nor the relatively small literature on Farmers' Rights to which it contributes, however, sufficiently cover the complex dynamics of how post-colonial states simultaneously negotiate global and national pressures on the issue of PGRs. Because the issues involved are too significant to be undeserving of more serious attention, clearly more needs to be done towards understanding how the socio-ecological tensions accompanying current efforts to expand the ecological frontiers are being contested at the local, national, and international level.

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ENDNOTES

- ¹ FAO Resolution 5/89.
- ² The FAO International Treaty on Plant Genetic Resources for Food and Agriculture (2001). Available at: <http://www.fao.org/plant-treaty/overview/en/>
- ³ Seed is used here as a generic term, referring to the part of the plant that is used for propagation, including both sexual seeds and vegetative seeds.
- ⁴ As several contributions to the Special Forum on Seed Activism in *Journal of Peasant Studies* (2020) illustrate, peasants and small farmers are aware of relations of exploitation and dependency in the commercial seed system, and sometimes resist these, sometime embrace them, and at others adapt to them.
- ⁵ Focusing on how states' technologies are used to create and appropriate value from nature, that is, maintaining the distinctiveness of categories such as nature and society, distances this contribution from Moore's recent attempts to collapse the nature-society distinction into the world-ecology category.
- ⁶ The most successful exports—wheat, corn, and soy—are not native; the U.S. soy crop, for instance, can be traced back to only six plants brought from China (Kloppenburg, 2004).
- ⁷ This does not necessarily mean that the local entwinement of earlier agricultural systems with PGRs was always benign and productive.
- ⁸ For instance, Kew Gardens was particularly involved in the introduction of rubber and cinchona from South America to British colonies in Asia. On its role on the transplant of the commercially significant plant of rubber from Brazil to South-East Asia, see Schultes (1977).
- ⁹ UPOV 1961 was initially signed by six European countries; the United States enacted its own Plant Variety Act in 1970 and joined UPOV in November 1981.
- ¹⁰ All UPOV versions (1961, 1972, 1978, and 1991) provide breeders with the exclusive rights to produce commercially, offer to sale and market protected plant varieties for up to 25 years. The 1991 version significantly narrows the earlier farmer "privilege" despite the fact Farmers' Rights were known then.
- ¹¹ FAO Resolution 8/83. Available at: http://www.fao.org/wiews-archive/docs/Resolution_8_83.pdf
- ¹² FAO Resolutions 4/89, 5/89, and 3/91 affirm, respectively, PBRs, Farmers' Rights, and nations' sovereign rights over their genetic resources.
- ¹³ WTO TRIPS stands for the World Trade Organization Agreement on Trade-related Aspects of Intellectual Property Rights.
- ¹⁴ The efforts to reconcile the CBD with FAOs' work on PGRs for agriculture that eventually led to the 2001 Treaty incorporated Farmers Rights largely at the insistence of the African Group. The US-AU-CAN axis was the most opposed, largely due to the interests of their global agribusiness companies and for fears that Farmers' Rights would expand the claims of their indigenous groups at home. The EU position was somewhere between this and the African Group, while Brazil's closer to the United States than the EU position. India's position was often between the EU position and the African Group one.
- ¹⁵ The 2018 *United Nations Declaration on the Rights of Peasants and Other People Working in Rural Areas*, 17 December 2018 (See UN Assembly document A/RES/73/165).
- ¹⁶ Brazil and India are among the 17 megadiverse countries that together house around two thirds of the world's biodiversity; Brazil is the most biologically diverse country in the world and accounts for between 15% and 20% of the world's biodiversity (see, <https://www.cbd.int/countries/profile/?country=br#facts>).
- ¹⁷ Although agriculture research was constitutionally a state subject, it was gradually appropriated by the central government; following the reorganization of the agricultural research system in the mid-1960s, ICAR (the Indian Council of Agricultural Research) assumed a central role, accounting even today for over 70% of the national agricultural R&D expenditure.
- ¹⁸ Pattenden (2016) suggests that in the case of India, it may be better to speak of "classes of labour" in the countryside, as complex new forms of engaging with a broad spectrum of livelihoods apart from agriculture have emerged since the liberalization reforms of the late 1980s onwards.
- ¹⁹ Jacobsen (2018), Brown (2020), and Nielsen (2018) argue that farmer movements from the 1970s onwards were dominated by the better-off farmers who were able to cast their demands in terms of farmers everywhere. In turn, these movements not only served as a safety valve on discontent in the countryside, but made the new approach to agriculture (then Green Revolution, more recently, neoliberal agriculture) accessible and desirable for smallholder farmers.

- ²⁰ On the elite-led nature of mobilization, see note 17. The act is available at: <http://lawmin.nic.in/Id/P-ACT/2001/The%20Protection%20of%20Plant%20Varieties%20and%20Farmers'%20Rights%20Act,%202001.pdf>
- ²¹ The most notable were the National Rural Employment Guarantee Act (2005) and the National Food Security Act (2013).
- ²² The criteria are the same—distinct, uniform, and stable—except from the novelty criterion and that farmers do not pay a processing fee for registration.
- ²³ See Jafri (2018). The more recent draft of the bill can be seen here https://www.prsindia.org/sites/default/files/bill_files/Draft%20Seeds%20Bill%2C%202019.pdf
- ²⁴ Embrapa, the Brazilian Corporation for Farming and Livestock Research, was created in 1973 to organize and expand public research on agriculture that until then had been decentralized.
- ²⁵ There was widespread anger about the plundering of Brazil's biodiversity that erupted on evidence of an unfavourable contract signed between BioAmazônia, a Brazilian social organization, and Novartis, the Swiss pharmaceutical company (Coutinho, Silva, & Marin, 2001).
- ²⁶ In his magisterial *Late Victorian Holocausts*, Mike Davies accounts how the *sertão* went through a number of transformative changes from the 18th century onwards.
- ²⁷ MPA (2018) "PL, 827/2015, Em Tramitação No Congresso Nacional Aumentará Monopólio Das Empresas E Coloca Em Risco A Soberania Alimentar E Genética Do Camponato" available at: <http://mpabrasil.org.br/pl-8272015-em-tramitacao-no-congresso-nacional-aumentara-monopolio-das-empresas-e-coloca-em-risco-a-soberania-alimentar-e-genetica-do-camponato/>
- ²⁸ Bancada Ruralista (the Rural Caucus) represents the interests of the rural landowning class and agribusiness; its political power has increased over the years and it now controls around half of Brazil's Congress.

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