

# The maize frontier in rural South India: Exploring the everyday dynamics of the contemporary food regime

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## Abstract

This contribution explores how new regions and crops are integrated in the contemporary food regime through a fieldwork-based approach to maize cultivation in rural Karnataka, South India. As an intrinsic part of the industrial grain–oilseed–livestock complex, maize is an important component of the contemporary food regime. I argue that the expansion of maize at the village level follows commodity frontier dynamics, located at the conjuncture of processes “from above” pushing the industrial grain–oilseed–complex forward and processes “from below” that integrate maize in everyday livelihoods. Focusing on how villagers make use of maize in ways that cross, but simultaneously are differentiated along, lines of class and caste, this article seeks to contribute to our understanding of the everyday dynamics of contemporary food regime.

## KEYWORDS

agrarian political economy, classes of labour, commodity frontiers, food regime analysis, India, political ecology, world ecology

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## 1 | INTRODUCTION

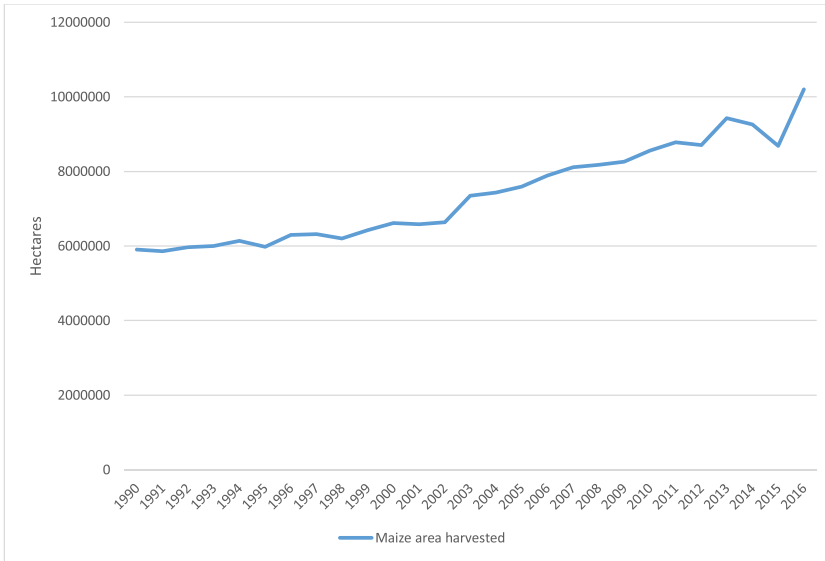
The last few years has witnessed renewed debate surrounding food regime analysis.<sup>1</sup> A prominent approach to the study of “food’s contribution to capital accumulation” (McMichael, 2013, p. 41), most existing food regime analysis has taken a global point of orientation. Through holistic and relational analysis, food regime analysis has explored the historical–geographical mechanisms, rules, and institutions that govern the accumulation of capital in agriculture in the state system, incorporating both production and circulation of food and agriculture (Friedmann & McMichael, 1989; Magnan, 2012; McMichael, 2009). Recent and ongoing debate has centred on how we are to understand the contemporary situation, including whether we are witnessing a consolidated “corporate food regime” (McMichael, 2005; McMichael, 2013) or a “neoliberal food regime” (Otero, 2012; Pechlaner & Otero, 2010) or, yet again, instead a transitional phase (Friedmann, 2009a). Debate has included criticism of much existing food regime literature for operating with too broad and “top-down” analytics in part a consequence of its “global” orientation to capital accumulation. Indeed, there is a consensus of sorts calling for reworking the food regime approach to be able to account for cases at the regional, national, or local scale (Jakobsen, 2018a, 2018b; McMichael, 2013; Otero, 2016; Otero, Pechlaner & Gürcan, 2013; Rioux, 2017; Wang, 2018). These limitations to the food regime approach have, in Bernstein’s (2016) view, revealed “the need for it to connect with other currents of agrarian political economy” (p. 643).

Taking a fieldwork-based approach, this article seeks to contribute to these ongoing attempts at reworking food regime analysis by looking at the case of booming maize cultivation in Karnataka, southern India. Building upon recent work that argues for the need for food regime analysis to engage in empirically embedded studies of transformations along “specific crops, regions and types of farmers” (Friedmann, 2016, 675; see also Wang, 2018), this article focuses on the actually existing mechanisms and processes involved in the integration of new regions and crops in, or expansion of, the contemporary food regime. I take the rise of maize in India as a case for exploring key restructuring in the contemporary food regime, namely, the corporate-led, financialized expansion of “flex crops and commodities” that feed into a porous agro-food–feed–fuel complex (Borras, Franco, Isakson, Levidow, & Vervest, 2016; Borras, McMichael, & Scoones, 2010). Here, the worldwide increase in meat consumption constitutes one crucial nexus of expanded capital accumulation (Weis, 2007, 2013). We thus find that an increasingly important aspect of the contemporary food regime is what Tony Weis calls the corporate-dominated “industrial grain–oilseed–livestock complex” (Weis, 2007, 2013). Having risen to global prominence at the height of the second food regime after the Second World War (Friedmann, 1993, 2009b), it is particularly in the neoliberal period that the complex has taken on properly global dimensions as countries in the South have experienced rapid “meatification” of diets (Weis, 2013). Coupled with the increasing corporate control that is exemplary of the contemporary corporate food regime (McMichael, 2013), agricultural restructuring paradigmatically takes the commodity form of meat, fed on global supply chains of grains and oilseeds. As a key part of the industrial grain–oilseed–livestock complex, maize is thus instrumental in pushing the contemporary food regime forward into new regions of the world including India (Jakobsen & Hansen, 2019). The processes whereby the industrial grain–oilseed–livestock complex integrates new regions into its reach can be expected to be shaped by complex interactions with local agrarian structures, to be explored through fieldwork in rural settings (see Fitting, 2011).

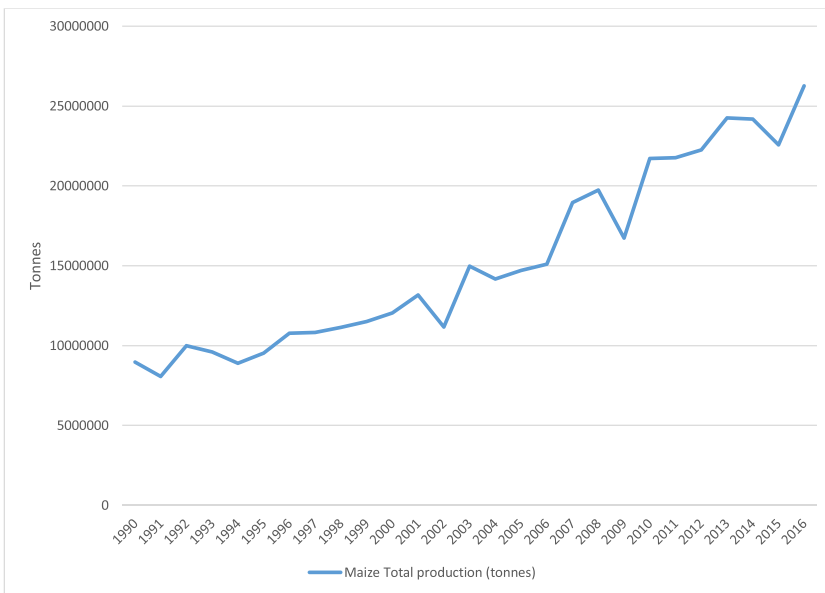
Meanwhile, unaccompanied by attention in agrarian scholarship, maize (*Zea mays*) has in recent years expanded at a rapid pace in India—especially its southern parts. Largely a monsoon (*kharif*) season crop, maize has emerged as the third most important crop categorized as “food crop” by the Indian government, after rice and wheat, cultivated by an estimated 12 million households in the country (Ranjit Kumar, Srinivas, & Sivaramane, 2013, p. 1; Modi, 2014). Booming maize cultivation thus departs from a broad trend in India during the period of neoliberal reform of diversification away from food crops (Mohanty & Lenka, 2016). Whereas rice and wheat have shown low growth rates in

<sup>1</sup>The most comprehensive recent instalment is found in the debate between Henry Bernstein (2016), Philip McMichael (2016), and Harriet Friedmann (2016) in 2016 in the *Journal of Peasant Studies*.

the context of India's "agrarian crisis" during the period of neoliberalization since the early 1990s, maize stands clearly out with its "impressive growth" (Ranjit Kumar, Srinivas, & Sivaramane, 2013, p. 6). From 1990 to 2016, the area harvested for maize in the country increased by 72.7%; wheat by 28.6%, and paddy a mere 0.6%. In the same period, total production of maize increased by 193%; production of wheat increased by 87.5%, whereas rice increased by 42.3% (Food and Agriculture Organization Corporate Statistical Database, 2018; see Figures 1 and 2).



**FIGURE 1** Maize area harvested, all-India (ha). Data compiled from the Food and Agriculture Organization Corporate Statistical Database by the author



**FIGURE 2** Maize production total, all-India (t). Data compiled from the Food and Agriculture Organization Corporate Statistical Database by the author

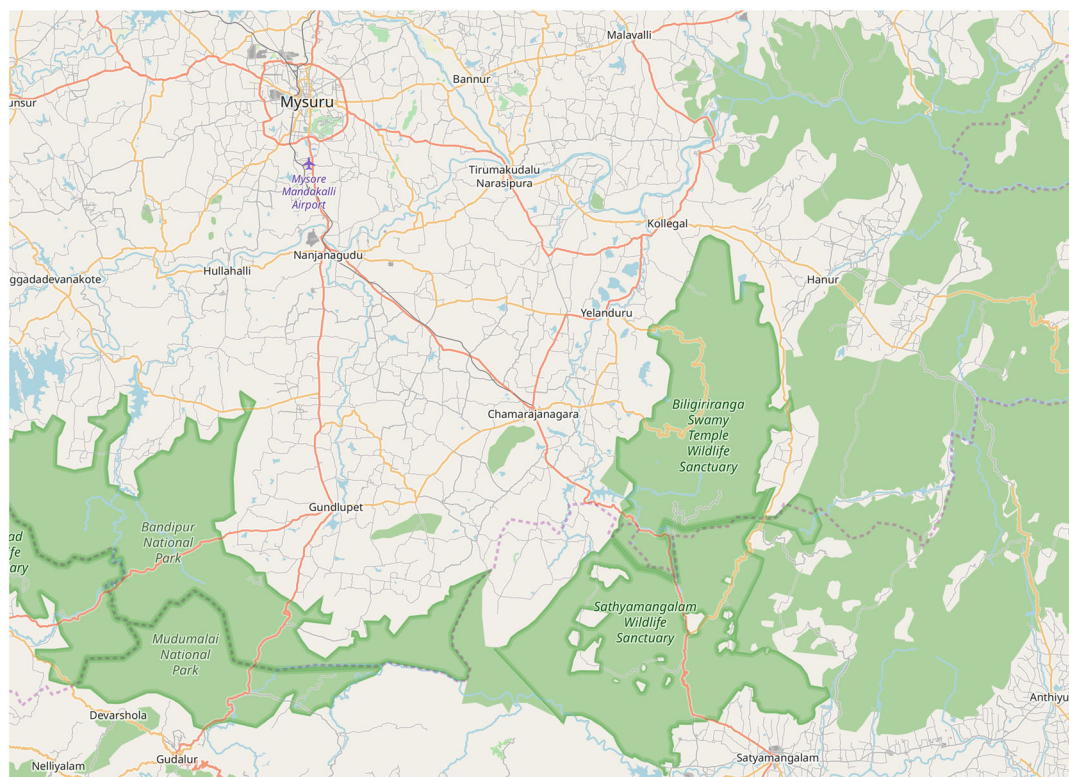
This has triggered Indian state officials, agribusinesses, and media to speculate about the emergence of maize as India's "new wonder crop" (Mukherjee, 2013).

How does maize, as a key component of the industrial grain–oilseed–livestock complex and thus the contemporary food regime, expand in South India? This article argues that it does so through "commodity frontier" (Moore, 2015) dynamics but, crucially, in different ways than what prevailing food regime literature holds. Whereas the food regime literature employs analytics "from above" emphasizing top-down dynamics following the movement of capital, I argue that the expansion of maize in South India comes about at the juncture of processes from above and very much localized "everyday" processes "from below" whereby maize is integrated in farmers' livelihoods. Such an approach enables us to explore "how multiple forces come together in practice to produce particular dynamics or trajectories" (Hart, 2004, p. 97). I draw on recent contributions that explore how commodity frontiers as well as the food regime are constituted in and through geographically specific circumstances at the intersection of appropriation of paid and unpaid work (Camba, 2018; Neimark & Healy, 2018; Rioux, 2017). In Moore's (2018) terms, both paid and unpaid "work/energy" is carried out not only by humans but by nature as well.

The notion that the integration of new crops and regions in the food regime happens through commodity frontiers is found in McMichael's (2005, 2009, 2013) prominent work, where the contemporary situation is seen as one of the corporate food regime of global reach and ever-expanding integration. But the food regime literature focuses overwhelmingly on macro-scale processes of capital accumulation, leaving largely unexplored their intersections with processes from below whereby new regions and crops are integrated in the contemporary food regime. This article suggests a novel approach to food regime analysis by focusing on the everyday. In her recent study of "[t]he emergence of capitalist relations in their routine but insidious form," Li (2014, p. 8) similarly foregrounds the not-so-spectacular, arguing that such a focus has tended to be neglected in critical agrarian studies. Yet the notion of the everyday invoked in this article does have parallels in recent rethinking of "accumulation by dispossession" and "land grabbing" (Hall, 2013), including in the South Asian context where scholars have pointed to the everyday dimensions or "routine processes" (De Neve, 2015, p. 347) through local research (Adnan, 2013; Vijayabaskar & Menon, 2018).

I draw on fieldwork in a village in a marginal part of Chamarajanagar district of southern Karnataka, where maize has risen to prominence in the last two decades. Along with neighbouring Andhra Pradesh, Karnataka is the leading maize-producing state in the country. In Chamarajanagar, the *kharif* acreage for maize expanded by a whopping 359% between 1998 and 2014, propelling it from the seventh most to the most grown crop in the district.<sup>2</sup> Although processes from above that push the expansion of maize in the region centre on the logics of the industrial grain–oilseed–livestock complex, I argue that these intersect with lived realities from below in a village where marginality has, over time, rendered the cultivation of maize a somehow useful livelihood option. I say *somehow* because I find—seemingly counter-intuitively—that maize does not expand primarily due to it being profitable. Instead, the multiple uses of maize enable the crop to be integrated in local livelihoods in complex ways across, but also differentiated along, class/caste lines. In a juncture where agrarian stagnation and crisis have rendered agriculture increasingly precarious, and where diversification out of agriculture has propelled the rural economy beyond the "agrarian," I focus particularly on how lower caste/class villagers use maize for "feeding" their livelihoods more broadly. In this way the maize boom parallels Richa Kumar's findings from ethnographic fieldwork among soybean producers in Madhya Pradesh, where poorer farmers are found to grow soybean not for reasons of technical "productivity" but due to it being "a low-risk, high-return crop, making it an ideal choice for poor farmers" (Richa Kumar, 2016, p. 90). In other words, profit is only part of the explanation for the spread of the crop. This means that we need to take the crop-specific (McCarthy, 2010) political ecology of maize seriously in order to understand how maize functions as a commodity frontier that enables integration of new crops and areas into the contemporary food regime. We find, thus, that the incorporation of maize growers in a broader economy as parts of "classes of labour" (Bernstein, 2006, 2010) is at the heart of what makes the crop-specific properties of maize useful enough to push the frontier forward from below. Nourished on regional patterns of uneven development (Neimark & Healy, 2018), the maize frontier

<sup>2</sup>These numbers are based on unpublished statistics gathered from Chamarajanagar district agriculture department.



**FIGURE 3** Map of field area

draws on how the crop fits into the drought-prone landscape, how it can feed livestock and be combined with wage labour. These socioecologically embedded reasons behind the maize boom would remain invisible to “top-down” analysis. Demonstrating the importance of fieldwork engagement to understanding how new crops and regions are incorporated in the contemporary food regime is thus a key aim of this article.

This article is structured as follows: First, I present methodological considerations and the field site. Then I proceed to lay out my theoretical positioning, presenting in more detail my take on food regime frontiers. Next, I move on to present the view from above of India's maize boom as a commodity frontier in the context of food regime restructuring. Then I shift perspective to explore the frontier from below at the village level, and finally I summarize conclusions drawn from this exercise.

## 2 | METHODS AND FIELD SITE

This contribution draws on data collected in September–October 2017 and February–March 2018 in Chamarajanagar district, southern Karnataka, as well as secondary source material on maize in India. It draws, also, on contacts and networks established during a mapping visit in August–October 2016, during which I studied elementary Kannada in Bangalore. The study is part of ongoing and exploratory fieldwork in an understudied region bordering to Tamil Nadu where the rural economy has become dominated by maize over the course of the last two decades.<sup>3</sup>

<sup>3</sup>Existing literature includes studies from nearby regions to the north that were part of former Mysore (Epstein, 1962, 1973; Karanth, 1995; Srinivas, 1976).

**TABLE 1** Number and area of landholding by size group, Kollegal taluk

Type of holding (acres)	Total number of holdings	Percentage of total holdings	Percentage of land held
Marginal (0–2.5)	40,592	61.5	27.5
Small (2.5–5)	17,108	25.9	34.9
Semi-medium (5–10)	6,826	10.3	25.2
Medium (10–20)	1,317	1.9	9.9
Large (over 25)	88	0.1	2.2

Note. Data from Karnataka State Agriculture Census 2010–2011.

Most of the data were collected in the village of Mekkenur<sup>4</sup> approximately 5 km from the small town of Hanur in Kollegal taluk<sup>5</sup> (see Figure 3). Having selected the region as a promising and understudied maize frontier, the village was chosen on the basis of information and access provided by initial contacts in Hanur. Mekkenur is a village of 326 households and a population of 1,368.<sup>6</sup> The dominant caste in the village is Lingayats, comprising some 100 households, residing in the central part of the village, leading in local politics and traditionally the main landholders.<sup>7</sup> Kurubas, which is an Other Backward Class group, comprises some 20–30 households including descendants of a major landholder two generations back. The rest of the population consists of around 100 households of both Scheduled Castes (SCs) and Nayakas, which is a group categorized as Scheduled Tribe (ST). Due to the absence of village records showing landholdings and not having carried out a survey myself, I lack conclusive land evidence. Yet my findings clearly indicate that the STs and SCs in the village were in possession of plots of land that would be categorized as “small and marginal” in government parlance (i.e., below 2 ha; Government of India, 2011). Indeed, small and marginal farmers predominate the agrarian scene in Kollegal taluk with as much as 87.4% of the landholdings (see Table 1). Group interviews revealed that, among the SCs, there was consensus that four to five families in the village were in the category of medium landholders, whereas STs did not have any substantial landholding families.

It quickly became clear to me that the majority of SC and ST landholdings were located at the outskirts of the village in places with less fertile (red) soil, whereas higher caste/class holdings were mainly located closer to the village in areas of more fertile (black) soil. Following from land redistributions undertaken in the 1970s, higher castes had been able to retain their lands, whereas lower castes were allocated former wasteland. Lower caste/class land was, moreover, close to hills and forests where wild boars and other animals were roaming as a nuisance for the farmers as they could eat and ravage crops. The threat from wild animals forced poor farmers in these parts to sleep in makeshift constructions during the season to protect their crops. Compounding my difficulties in determining landholdings was the fact that plots were “dispersed,” with single owners having smaller plots in more than one location around the village.<sup>8</sup> In group interviews across class/caste groups, the extent of landlessness in the village was calculated by villagers to be around 30–40%, with a slightly higher proportion of STs landless than other castes.

Mekkenur is located in a drought-prone region. Agricultural officers stationed in Hanur calculated that the region is dependent on rainfed agriculture (*bejjalu*) on at least 70% of the acreage. Mekkenur has slightly more irrigation with rainfed land comprising 60% of the cropped acreage.<sup>9</sup> Irrigated agriculture (*neeravari*) is only available in the form of borewells, which have multiplied in recent years due to a particular government scheme (Ganga Kalyana) catering to SC and ST farmers as well as private investments by well-off farmers predominantly from dominant

<sup>4</sup>The village name is a pseudonym derived from *mekkejola* meaning maize in Kannada and *uru* meaning village.

<sup>5</sup>Taluk is the unit of administration below district level.

<sup>6</sup>These numbers are derived from the Village Accountant's office.

<sup>7</sup>Lingayats are composed of several subcastes, where some are categorized as “general category” and others “other backward classes” in Karnataka.

<sup>8</sup>According to Hill's (1982) classic work from a dryland agricultural village south of Bangalore, “dispersal of farm-plots” is a “fundamental feature” of dryland agricultural systems (p. 55).

<sup>9</sup>Numbers are derived from the Village Accountant's office.

**TABLE 2** Landholdings of respondents in Mekkenur

Caste	Marginal and small	Semi-medium and medium	Large	Landless	Number of villagers interviewed
Lingayat	7	10	1		18
Kuruba	8	1	2		11
Scheduled Caste	14	1		12	27
Scheduled Tribe	5	2		4	9

Lingayats and Kurubas. Through group interviews with farmers, I learned that borewell irrigation is now present in about 40% of Lingayat landholdings, 50% of Kuruba holdings, and 30% of SC and ST holdings.

In Mekkenur, I worked primarily through ethnographic methods, spending time with villagers in order to learn about their livelihoods and agricultural patterns. I quickly found that relying on interviews strictly defined was deemed too time-consuming by villagers leading lives of hard and long working hours. Instead of trying to arrange for sittings with villagers, I therefore spent most of the time chatting and engaging in semistructured interviews with villagers at tea stalls, shops, streets, and other public spaces and in people's houses as well as—crucially—travelling by motorcycle between agricultural fields, accompanying farmers and their livestock. In so doing, I depended fully on my interpreter, without whom free-ranging conversations in Kannada would have been impossible.<sup>10</sup> Frequently, these interactions involved group discussions with villagers joining in the conversation while others departed. The body of data that I draw upon thus has several strands to it. An important set involves semistructured interviews with villagers across all caste groups in the village based on streetwise interactions, during which I collected key data about landholdings, cropping patterns and expenses, labour practices, and livestock, as well as broader issues about socio-economic change in the village. With a view for landholdings, these interviews are compiled in Table 2. In addition, I had group discussions with women villagers through self-help groups. These meetings involved two meetings with 10 SC women each and one meeting with 10 ST women. I also interacted with a large number of villagers of all castes in the course of my more ethnographically oriented fieldwork, but these interactions were looser and did not involve me collecting data about landholdings (and are thus not included in the table).

In addition to Mekkenur, the paper also draws on interactions with villagers in several other villages in the nearby region. Moreover, I also interacted with agro-shop keepers in Hanur, many of whom, as key intermediaries and “merchants of knowledge” (Aga, 2018), were able to provide insightful details about agricultural patterns in the region. These conversations were also highly informal, often having myself sitting down at a chair in their shops, discussing with them over a cup of chai between customers. Similarly, I also met with agricultural department officers, veterinary hospital employees, and others with expertise on things agrarian in Hanur. The last group of informants was “experts” based in Bangalore. Here I draw on a small set of semistructured interviews with bureaucrats in the Agricultural Department, agricultural scientists, and private seed company employees. This last group was mainly interviewed for data regarding the broader dimensions of India's—and Karnataka's—maize boom.

### 3 | FOOD REGIME FRONTIERS

Departing from the previous food regime (1940s–1970s) of strong national regulations over agriculture, the corporate food regime is, as the name implies, perceived as representing corporate domination and hegemony in agri-food, underpinned by neoliberal principles (McMichael, 2005, 2009, 2013).<sup>11</sup> Setting the corporate food regime further apart from the preceding period, McMichael (2005, 2009, 2013) takes the contemporary situation as one of

<sup>10</sup>I would like to express my gratitude to Y. D. Imran Khan for his invaluable contribution as my interpreter, guide, and friend.

<sup>11</sup>Whereas McMichael's formulations imply receding importance to state vis-à-vis corporate capital, others have questioned this in thinking of neoliberalism in relation to the contemporary food regime as involving more active and dynamic state action (Jakobsen, 2018a, 2018b; Pechlaner & Otero, 2010; Pritchard, Dixon, Hull, & Choithani, 2016).



escalating dispossession for rural populations worldwide, a notion that is common to food regime literature (Bernstein, 2016; Friedmann, 2005, p. 265; Pietilainen & Otero, 2018). Focus has largely been on the spectacular and eye-catching violent land grabs, corporate appropriation of crops and commons, and other forms of “accumulation by dispossession” (Harvey, 2003) whereby populations and environments across the world are integrated in the corporate food regime. Indeed, the expansion of the food regime appears written “in letters of blood and fire” (Marx, 1976, p. 875). In McMichael’s (2005) words, the “corporate food regime” is characterized by “the appropriation of agricultural resources for capitalist consumption relations” that, he says, “is realized through an expanding foundation of human impoverishment and displacement, and the marginalization of agrarian/food cultures” (p. 279). In this rendering, the expansion of the food regime happens through an incessant search for frontiers for expanded capital accumulation in the face of crisis tendencies (McMichael, 2013, pp. 109–130). And the frontier, as Rasmussen and Lund (2018) recapitulate, tends to be conceptualized in equally, if not even more so, exceptional imagery: Violence, destruction, rupture are expected, indeed defining, features of the frontier. Seeking opportunities for “spatial fixes” (Harvey, 1982; McMichael, 2013, p. 109) for its inherent and accelerating contradictions through frontier processes, the expansion of the corporate food regime appears, first and foremost, as driven from above (see, e.g., McMichael, 2012).

The food regime literature therefore leaves largely unexplored processes from below whereby new regions and crops are integrated in the contemporary food regime. This is arguably a consequence of food regime analysis’ self-consciously capital-centric approach (McMichael, 2013, p. 131), having the world-systemic accumulation of capital in food and agriculture as its main focus, as pointed out also by Bernstein (2016) in his recent critical engagement. In foregrounding the world-systemic, Bernstein suggests, food regime literature has tended to restrict its focus to “external” determinants of agrarian change, to be complemented by more sustained attention to “multiple determinations” across scales (Bernstein, 2016). This contribution joins these debates by bringing together food regime analysis and a political ecological commodity frontier approach by foregrounding the everyday. In advancing his take on the crises of the contemporary food regime, McMichael (2013) draws substantially on the world-ecological approach developed by Moore (2015). This is a similarly world-systemic approach to thinking capitalism and nature as intertwined. It may seem counter-intuitive to bring in another macro-oriented approach in order to develop a view of the everyday dynamics of the contemporary food regime. Yet Neimark and Healy’s (2018) recent work shows that Moore’s framework can be fruitfully engaged in fieldwork-based research.

What is a world-ecological commodity frontier? “Capitalism,” writes Moore (2015), “is a frontier process” (p. 107). By this, he means to say that capitalism—as a world-ecological process of organizing humanity in nature/nature in humanity (Moore, 2015, p. 49)—proceeds through incessantly expanding the scope of accumulation at the intersection of “accumulation by exploitation” and “accumulation by appropriation” (Moore, 2015, p. 73). Where exploitation points to the familiar terrain of the labour theory of value and paid work, by appropriation Moore points to “nature’s life-making capacities” where “unpaid work/energy is appropriated in service to commodity production, and opens new opportunities for capital investment” (Moore, 2015, p. 95). This happens through what Moore (2018) calls the Four Cheaps, that is, “those necessary elements of capitalist re/production—above all, labor, food, energy and raw materials” (p. 241). Keeping these as cheap as possible through frontier processes of gaining access to relatively less capitalized natures (both human and extra-human) “outside the centers of commodity production” (Moore, 2018, p. 246) enables capital accumulation to thrive. Commodity frontiers are thus both geographically constituted and “socio-ecological relations that unleash a new stream of nature’s bounty to capital” (Moore, 2010, p. 245). Intrinsic to Moore’s (2015) conception of commodity frontiers is the notion that the work of women has been, and is, central. The world-ecological perspective is thus, importantly, a contribution to the feminist Marxist tradition of foregrounding the role of unpaid work to the expansion of global capitalism (Bhattacharya, 2017; Federici, 2004; Mies, 2014/1986). Interestingly, Camba (2018) recently links this perspective to food regime analysis by thinking of the appropriation of paid and unpaid work in the capitalist world-ecology as the conjoined form whereby the global production of value channels into the food regime (see also Araghi, 2003). He discusses ways by



which this “nexus of paid and unpaid work” (Camba, 2018, p. 4) functions as a form of subsidy to capital through examples such as draft animals' contribution to food production.

These contributions towards a “labour-centred approach to food regime analysis” (Rioux, 2017, p. 716) can be made more germane to our purpose in combination with Bernstein's (2006) notion of classes of labour:

*Classes of labour comprise “the growing numbers ... who now depend—directly and indirectly—on the sale of their labour power for their own daily reproduction” (Panitch and Leys, 2001, ix). And the term “fragmentation” encapsulates the effects of how classes of labour in global capitalism, and especially in the “South,” pursue their reproduction, that is, through insecure and oppressive—and in many places increasingly scarce—wage employment, often combined with a range of likewise precarious small-scale farming and insecure “informal sector” (“survival”) activity, subject to its own forms of differentiation and oppression along intersecting lines of class, gender, generation, caste, and ethnicity. In short, most have to pursue their means of livelihood/reproduction across different sites of the social division of labour: urban and rural, agricultural and non-agriculture, wage employment and self-employment. (p. 455)*

As Pattenden (2016, 2018) argues, the majority in rural India is currently incorporated in the wider economy—and, by implication, in the food regime—as exploited parts of classes of labour (see also Lerche, 2010). In this contribution, I argue for strengthening our understanding of how the contemporary food regime expands at the intersection of incorporating paid and unpaid work.

Further, in Moore's (2015) view, the neoliberal, contemporary phase of capitalism is marked by increasingly “savage” accumulation strategies in the attempt at working against “the relative contraction of opportunities for appropriation” (p. 154). At times, Moore comes very close to saying that the current conjuncture is one where Cheap Nature is exhausted and capital's incessant expansion through frontiers has reached its exhaustion on a global scale (p. 89). Drawing on these ideas, McMichael (2013) argues that the current crisis of corporate food regime—including crises of accumulation, food, energy, and climate—signals the underreproduction of nature, meaning exhaustion, either “relative” or “absolute.” A situation of relative exhaustion implies an increased press for frontiers as spatial fixes (McMichael, 2013, p. 115). Where Harvey's (1982, 2003) notion of the spatial fix refers primarily to crisis of overaccumulation, the world-ecological notion incorporates underreproduction akin to Ekers and Prudham's (2017a, 2017b) recent notion of “socioecological fixes.” Frontier movements, then, are all about seeking relatively uncaptured spaces where food, labour, energy, and raw materials can be accessed at lower costs (Moore, 2015). McMichael suggests that recent restructuring of the agro-food-feed-fuel complex into an interconnected, porous, and speculative assemblage—taking such forms as biofuel booms and flex crops—represents one example of frontiers for capital (McMichael, 2013, pp. 115–116). Building on these ideas, Dixon (2017) has also recently argued for seeing corporate expansion in agro-food into desert regions in Egypt as an example of commodity frontier movements.

Here too these dynamics appear largely driven from above. Exploring the integration of new crops and regions in the food regime through frontier dynamics at the conjunction of forces and processes from above and everyday processes from below may help us spell out more explicitly the uneven geographies of food regime expansions. Rather than assuming that such expansions percolate downwards to hit particular countries, the conjunctural approach to frontiers I advance in this paper brings to view the possibility that contemporary food regime may expand in and through specific geographies, places, and histories in a checkboard-like unevenness.

#### 4 | THE MAIZE FRONTIER SEEN FROM ABOVE

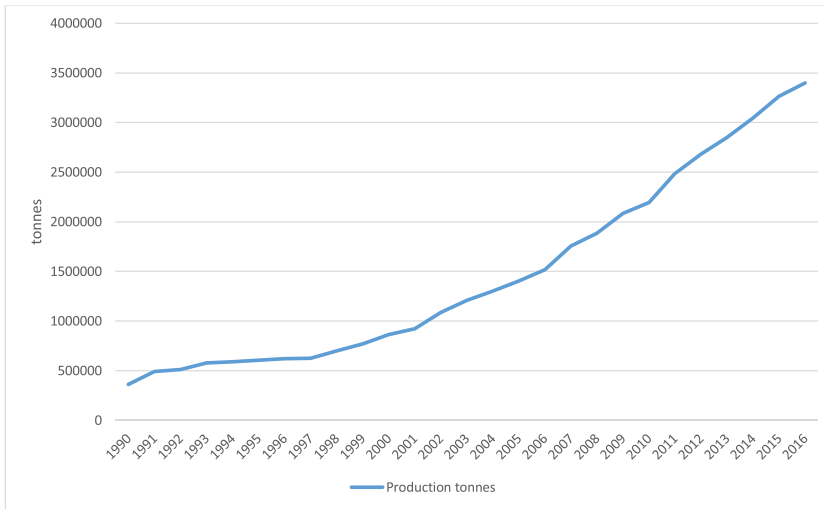
The role of maize in the wider trajectory of agricultural transformation in India appears largely ignored, despite the long history of maize in the country. Some scholars have argued for a pre-Columbian introduction of maize (Johannessen & Parker, 1989), whereas others have argued for its introduction in the 16th century by the

Portuguese (Singh, 1977). Largely ignored is also the fact that maize was the (subsequently side-lined) starting point for the so-called green revolution in the country (Patel, 2013). Although we have come to know the story of the Green Revolution in India as one of wheat, and subsequently rice, it started with maize. In the early 1950s, the Rockefeller Foundation in collaboration with the Indian government decided to initiate research in hybrid varieties of maize, building on the prior work of the Foundation in Mexico. This despite maize only comprising 3% of India's gross cropped area at the time (Lele & Goldsmith, 1989, p. 314; Roy, 2006, p. 128). One study of cropping patterns based on late-1950s government data shows that maize was a staple food in hilly and mountainous parts of northern India (Bhatia, 1965). Prior to the recent expansion, maize was indeed mainly grown for human consumption (over 80% of the production, according to one study from the 1970s) in the form of unleavened bread in northern India (Singh, 1977, p. 7).

The recent expansion of maize follows a different pattern. In keeping with the food regime perspective on commodity frontiers, the external drivers behind India's maize frontier can be analysed in terms of socioecological cycles of accumulation. I have elsewhere argued that India's current "agrarian crisis" largely centred on the rice–wheat growing and heavily capitalized homelands of the Green Revolution—characterized by deteriorating livelihoods and environments, sinking rates of profit, technological treadmills and accelerating "biophysical contradictions" (Weis, 2013)—constitutes an example of an accumulation cycle facing exhaustion (Jakobsen, 2018a, 2018b). This accumulation cycle was initiated with developmentalist state intervention typical of the era of the second food regime. What India is witnessing now in forms such as the state's withdrawal from the agro-food system constitutes concerted attempts at moving beyond this exhausted accumulation cycle. These attempts involve agro-capital searching for socioecological fixes to crisis tendencies. I suggest that we take the turn to maize as one contemporary attempt at initiating new cycles of accumulation. In so doing, we are following Indian environmentalists who have critically noted that the rise of maize indicates that "another revolution is in the making, but one formulated and directed by the private sector" (Narayan, Suchitra, & Sood, 2011). As we will see, the maize frontier emerges in semiarid parts of India less capitalized than the homelands of the Green Revolution now facing exhaustion, enabling agro-capital to appropriate relatively cheaper work/energy of human and extra-human nature.

Indeed, the explosive growth of maize in the context of an otherwise stagnant agricultural economy has triggered hopeful assessments—more and faster growth appears the path of the future. Not only seen as a potential "miracle crop," maize is also frequently designated the "crop of the future" among Indian policymakers and agribusinesses. The Indian Institute of Maize Research "Vision 2050" report, for example, pictures a tripling of maize production by 2050, perceiving maize as the crop for a future of "limited natural resources and a changing climate" (Research, I. I. o. M., 2015, p. vii). Others, including India's Agriculture Minister, have recently talked of doubling maize production by 2025 (Sen, 2016). Although certainly celebrating the achievements thus far, these narratives share features with what White, Borrás, Hall, Scoones, and Wolford (2012) have identified as a widespread "yield gap" narrative in corporate agricultural strategies. Seeing Indian maize as of today as suffering from a yield gap, the agribusiness sector in particular argues for a cocktail of R&D in hybrids, public–private partnerships, export orientation, and commodity chain integration as favoured strategies for achieving the desired expansion (KPMG, 2014; Narayan, Suchitra, & Sood, 2011).

The corporate food regime concentration in the maize market strongly differs from much of India's agrarian capitalism, which is decentralized with agribusiness "dominated by small-scale, informal firms" (Frödin, 2013, p. 230; see also Harriss-White, 2002). Unlike corporate food regime dynamics, a key pattern in much of India is petty commodity production engaged in by broad sections of the country's classes of labour (Harriss-White, 2012). The features of the industrial grain–oilseed–livestock complex in India, as we will see, show striking corporate concentration. Although the Green Revolution-initiated accumulation cycle was based on heavy state involvement in the country's agro-food system, private capital drives the maize frontier. As one high-ranking agricultural department official in Bangalore told me in an interview, the expansion of maize "is more or less market-led, not government push. Diverse sectors—multinationals, who else—are the actual drivers. Not the government. In all other crops the government has tried to push but here it's market-led, although it's supported by government." Other agriculture department officials



**FIGURE 4** Chicken meat production in India (t). Data compiled from the Food and Agriculture Organization Corporate Statistical Database by the author

underlined the same point in several interviews: R&D units belonging to biotechnological seed companies drive technological development in the maize sector, as industry reports also corroborate (Federation of Indian Chambers of Commerce and Industry [FICCI], 2018).

The corporate nature of the maize boom is also evident in the seed market. Agriculture department and seed company informants in Bangalore variously estimated that the maize seed market houses somewhere between 30 and 50 companies. Among these, we find that three of the top five companies are also members of the infamous “Big Six” of world-leading agribusinesses controlling 60% of the global seed market (International Panel of Experts on Sustainable Food Systems, 2017, p. 21): DuPont Pioneer, DEKALB (a subsidiary of Monsanto/Bayer), and Syngenta. Apart from these, we find the company Bisco, an Indian subsidiary of Limagrain, which clocks in as the world’s fourth largest seed company. The only domestic company on the top five is Kaveri Seeds, which is among the country’s major agribusinesses with reported net sales of Rs. 669.89 crore in 2016–2017 (Limited, 2017).

The private character of the maize frontier is evident from the demand-side too. As I have indicated, the maize boom partakes in broader patterns of restructuring the global food regime, where the rise of the industrial grain–oil–seed–livestock complex makes maize increasingly profitable. In India, it is clearly so. In terms of the flexibility of maize, reports acknowledge its manifold uses in the Indian context—in feed, particularly poultry feed, starch, and other industrial products—as triggering its rise (FICCI, 2015). As several sources agree that poultry feed comprises above 50% of the end use for maize in the country (Modi, 2014), it is clear that poultry is a major driver of the maize boom.<sup>12</sup> Data show that poultry is booming (see Figure 4). Production and consumption of poultry in the form of both chicken meat and egg increases rapidly in India; consumption has been calculated to increase by 7% annually, totalling 4.5 million metric tons of chicken meat in 2016 (Gandhi, 2018; see Figure 4; Intodia, 2016). Indeed, the poultry sector differs from other forms of agricultural production in India in being more industrialized with concentrated factory farms: “About 90 percent of the more than two billion ‘broiler’ (meat) chickens produced in India each year are raised in industrial-style facilities” (MacDonald & Iyer, 2012, p. 5). Although still low in comparative terms, middle-class lifestyle in urban India sees an increasing prominence of meat eating—which means primarily chicken as the favoured meat. Indian cities and towns of various sizes are now dotted with outlets selling fresh chicken meat. Since 2007–2008, moreover, India has become a net exporter of maize, an export that reached 4.27 Mt in

<sup>12</sup>One important industry report holds the usage of maize for feed to be “about 60%” including 47% for poultry and 13% for other livestock feed (FICCI, 2018).

2012–2013, mainly to Southeast Asia (Ranjit Kumar, Srinivas, & Sivaramane, 2013). The maize boom may, in other words, eventually have consequences far beyond India's borders (see Jakobsen and Hansen, 2019).

The recent maize expansion has been dominated by a few Indian states: Karnataka and Andhra Pradesh, with around 38% of total production in 2011 (KPMG, 2014, p. 12). Karnataka's share of all-India maize production was estimated at 17.8% in 2013–2014 (Karnataka, 2016). In these “new” maize producing areas, we find that 100% of the acreage currently is under hybrid varieties, whereas in “older” maize areas (such as Rajasthan and Madhya Pradesh), hybrids account for only about 20% of the acreage (KPMG, 2014, p. 13). The new areas of maize expansion are predominantly semiarid parts where capitalization has not reached the extent seen in the Green Revolution heartlands. One recent report expresses the notion of a spatial fix in the context of socioecological exhaustion as follows: “The last decade of the twentieth century witnessed extensive economic reforms in India, which in turn saw growing stocks of surplus wheat and rice. This, however, came at the associated cost of degradation of both soil and water resources [...] Maize is considered a promising option for diversifying agriculture in upland areas of India” (Joshi, Singh, Singh, Gerpacio, & Pingali, 2005, p. 1).

Hybrid maize is perceived as suitable for parts of the country where agriculture has hitherto been less heavily capitalized than in the irrigated heartlands of the Green Revolution. Not only “uplands” as referred to here, broad sections of semiarid India are targeted: “these hybrids have already made significant inroads into several parts of the country, especially in areas that face droughts, diminishing water resources and weather-related constraints” (Sud, 2011). One agribusiness report holds that “[f]actors such as adaptability to diverse agro-climatic conditions, lower labour costs and lowering of water table in the rice belt of India have contributed to the increase in acreage” (KPMG, 2014, p. 11). Note the mention of labour. We need to make note of two further points here. First, the notion of “diversification” in the context of crisis—climate crisis, agrarian crisis—means that maize as a commodity frontier emerges from the socioecological particularities of agrarian change in contemporary India, where farmers in semiarid parts in particular are in distress. In their way, informants in seed companies in Bangalore brought up the same point, one emphasizing that the strong growth of the maize sector has happened in a period also characterized by “inconsistent rains” where, as he said, “farmers were in need of new crops.”

Second, the expansion of maize is framed as an incursion into areas relatively marginal to Indian agrarian capitalism. Semiarid, lacking in irrigation facilities, and generally marginalized in many ways, Harriss-White (2008) has called these areas “India's rainfed agricultural dystopia,” characterized by

*an increasingly risk-beset, polarized and indebted agrarian capitalism dominated by micro-production and its credit and exchange relations. The mass of small-scale farms are not “un-incorporated”, they are incorporated in a differentiated way such that much agriculture is a part-time component of a complex livelihood portfolio dominated by labouring. (Harriss-White, 2008, p. 553)*

The production of the maize frontier thus happens through historically and discursively constituted regional patterns of uneven development (Neimark & Healy, 2018).

#### 4.1 | The maize frontier in Karnataka

Most of Karnataka, barring parts along the coast and in the Western Ghats, is largely semiarid. This warrants common descriptions of agriculture in Karnataka as “characterized by vast steppes of drought prone regions and sporadic patches of irrigated area” (Bhende, 2013, p. 1), with only 36% of the net cultivated area under irrigation (Karnataka, 2016). In Karnataka, we find that between 2005–2006 and 2014–2015, maize has been increasing rapidly in acreage, from 9.36 to 13.37 lakh ha, making it the top crop in the state equal to paddy (Commission, 2016). Ninety per cent of the production is in the kharif season, with most districts showing increased production except for the humid districts along the coast and in the Western Ghats (Karnataka, 2016). Many of the other main agricultural crops—sorghum (jowar), rice, finger millet (ragi), and groundnut—have decreased over time, whereas there has been a strong

**TABLE 3** Major crops in Karnataka, decadal change (area in lakh hectares)

Crops	2005–2006		2015–2016	
	Area	Percent	Area	Percent
Maize	9.36	8	13.37	13
Jowar	14.85	13	13.27	13
Ragi	15.20	13	10.46	10
Cotton	4.13	4	8.76	9
Bengal gram	4.18	4	9.39	9
Tur	6.00	5	7.28	7
Ground nut	10.40	9	6.54	6
Sugar cane	2.21	2	4.80	5

Note. Data from Commission (2016).

growth in maize as well as sugar cane, cotton, and some pulses (see Table 3). In addition, horticultural crops have increased, mirroring the mentioned all-India shift towards higher value crops (Ramakumar, 2017).

Now, marginality is often a defining feature of frontiers. It is not uncommon to take frontiers as “liminal” spaces closely associated with borders, hinterlands, unruly, and remote spaces vis-à-vis state projects as well as capital (Rasmussen & Lund, 2018). The same goes for the specific “rainfed agricultural dystopia” that I will explore in what follows. Chamarajanagar is located in the southernmost part of Karnataka, bordering both Kerala and Tamil Nadu. The district was carved out of Mysore district in 1997 “to give a push to development” but continues, as widely perceived in public, “to languish as a backward region” (Krishna Kumar, 2014). In 2005, Chamarajanagar was ranked 25th out of Karnataka's 27 districts in terms of human development, in stark contrast to neighbouring districts (Karnataka, 2006). Here it needs to be pointed out that only sections of Chamarajanagar was part of Mysore state prior to Independence, arguably benefiting from the path-dependent effects of the development measures taken by the Mysore government. Much of Chamarajanagar was, however, very peripheral to Mysore, far from headquarters of administration. My field site was just beyond the border of Mysore kingdom and comprised a hilly and rainfed utmost periphery of Madras Presidency. The region is thus the product of long histories of being marginal to state projects. What this implies is that it differs markedly from what we know about the region more broadly. Landmark studies such as Srinivas' (1976) or Epstein's (1962, 1973) work from Mysore thus describe rather different patterns of change in much less marginal places. The closest existing scholarship comes is Charsley's (1982) study of sericulture in Kollegal town. Even here we do not, however, get any further glimpse of Kollegal's rural hinterlands. Charsley merely points out that “Kollegal is the gateway to hilly country” to the east (p. 42). This hilly country is where I have studied maize expansion on the ground.

## 5 | THE MAIZE FRONTIER SEEN FROM BELOW

The village of Mekkenur is located in Kollegal taluk, hitherto the largest taluk in Karnataka. At the time of writing, the region undergoes incorporation in the newly established Hanur taluk, officially seen as an effort at developing the region through closer state administration. Popularly, the Kollegal region is considered a backwater where few would venture unless absolutely necessary. Kollegal is, moreover, an infamous seat of “black magic” and a concomitant discourse of fear. During my fieldwork, people kept telling me that state chief ministers have avoided the region due to fear of being cursed, and this part of Chamarajanagar has recently come into the spotlight for allegations of black magic being used as part of the 2018 Karnataka state elections. This historical and discursively produced marginality has only of late combined with any real interest shown in the region by outsiders, now in rather typical frontier-like ways. Over the last couple of years, several solar power plants have popped up across the region, as I



**FIGURE 5** Agro-shop in Hanur showcasing Dupont Pioneer hybrid maize seeds. Photo by author

discovered by travelling around the landscape. In a few kilometres' radius from Hanur, I mapped four solar plants, one of which was reported to spread over 450 acres of land.<sup>13</sup> Spending time in Hanur, I quickly started noticing migrant labourers from Jharkhand and other parts of India passing through on trucks heading for these solar plants. Other “frontiersmen” are not hard to find either: Land brokers, seen as “urbanites” coming from Hanur town or farther afield, seem to thrive in a recent situation of increasing land prices. The owner of my regular tea stall in Hanur, for example, revealed himself to be doubling as land broker. Outsiders—“businessmen” from Bangalore with fancy cars—are buying land, unlike earlier.<sup>14</sup>

In this place, hybrid maize has expanded rapidly over the last two decades. Moving across Hanur, you find every single agro-shop advertizing for hybrid maize and keeping seed packets upfront in the stores, indicative of the crop's dominance in the agrarian economy and its prominence among agribusinesses operating in the region (see Figure 5). In keeping with the overall picture of the industrial grain–oilseed–livestock complex in South India, as shopkeepers

<sup>13</sup>A subsidiary of the Adani Group, one of India's major corporate conglomerates, runs at least one of these solar plants.

<sup>14</sup>From what I have gathered, rates have increased rapidly in recent years, but the extent to which land is sold is still low (see also the relevant discussion in Vijayabaskar & Menon, 2018). The plots that I discovered to be sold to outsiders were all classified locally as “wastelands” (see, e.g., Baka, 2013).

explained to me, the market in hybrid maize seeds in Hanur is packed with as much as 15 supplying companies, of which the major ones are Kaveri, Pioneer, and DEKALB (i.e., Monsanto/Bayer). Although most farmers in Mekkenur reported that they would go to Hanur to purchase seeds from the agro-shops, there was also a system of subdealers for the various seed companies involving individuals located at the village level.

Likewise, maize cultivation in the region is tightly integrated in the industrial grain–oilseed–livestock complex as the produce is sold primarily to poultry companies across the border in Tamil Nadu. Commonly mentioned was Suguna Food, India's leading poultry company with a Rs. 7,880 crore turnover in 2016–2017, headquartered in Coimbatore.<sup>15</sup> Villagers would emphasize the benefit of the “good market” and “demand” from poultry companies keeping prices relatively stable. Moreover, buyers were reported to arrive at the farm to buy the maize produce, making it unnecessary to travel to the market. These buyers could be representatives of poultry companies or intermediaries generically referred to as “middlemen from Tamil Nadu,” both of which were described as offering acceptable prices. Alternatively, farmers reported selling to local middlemen from their own or nearby villages, on the basis of relations of trust. Most of the farmers I talked to expressed lack of interest in who the buyer is or what the maize is used for; rather, the sense was that the market in maize was beneficial enough that they could easily sell to whomever “came first,” as farmers would say. All of this was seen by respondents as contrasting sharply with other agricultural commodities that were sold on state-run markets with fluctuating prices, greedy traders, unreliable price setting, and the added expenses of transporting the produce to the market.

Yet, although the industrial grain–oilseed–livestock complex is centrally involved in the logics of maize cultivation in the region, in villagers' own view of the maize boom, it did not in fact start with the expanding reach of this complex into their surroundings but instead in a more everyday manner as maize started being cultivated by neighbouring Tibetan refugees. These Tibetans, residing in a cluster of resettlement groups some 30 km from Hanur, first started cultivating hybrid maize in their fields. The common story was that villagers in Mekkenur and surroundings “learned that the Tibetans were benefiting from growing maize,” and so they simply imitated them. The first person to have picked up maize near Mekkenur was a Lingayat major landholder who said that he learned of it around the year 2000 from relatives living close to the Tibetans. Others told similarly of having heard stories or personally observed the Tibetans as the explanation for the spread of maize. Today, maize (*mekkejola*) is by far the most widespread crop in Mekkenur and nearby villages. In the agricultural year of 2016–2017—which, as I will return to below, was a year of drought—66% of the cultivated irrigated land and 82% of the cultivated rainfed land in Mekkenur was growing maize.<sup>16</sup>

This means that maize has displaced traditional crops, in particular ragi (finger millet), which used to be the main rainfed crop in the village. In the agricultural year of 2016–2017, ragi was only grown on 30 acres of rainfed land, a mere 7.5% of the size of rainfed land growing maize that year.<sup>17</sup> Elderly informants narrated social change in the village as a transition from growing ragi for own consumption in their youth to agricultural commercialization where food is bought on the market. Ragi was also the main food and *ragi mudde* (balls of ragi) remains the daily dinner.<sup>18</sup> I found many farmers growing ragi on a small section of their land (no more than one quarter of the land) for own consumption, but that was about it. Yet the story is not one of straightforward monocultural appropriation: Villagers could easily list up to 18 different rainfed and five irrigated crops (including “vegetables” as a covering term for many varieties) being cultivated. Villagers as well as agro-shop keepers were very careful in explaining how maize is put to use as part of a wider portfolio of crops. That is particularly so for farmers having at least part of their land under irrigation. I did not find a single irrigated farmer who had shifted fully into maize. Rainfed farmers were in many cases found to be exclusively, or primarily, relying on maize. Here comes the puzzle: When prompted, not a single farmer held maize to be profitable. A seemingly indifferent shrug often accompanied statements to that effect.

<sup>15</sup>See [http://www.sugunafoods.co.in/about\\_suguna/overview/overview.asp](http://www.sugunafoods.co.in/about_suguna/overview/overview.asp)

<sup>16</sup>Data compiled from the Village Accountant's office.

<sup>17</sup>Data compiled from the Village Accountant's office.

<sup>18</sup>Describing his childhood, one SC man in his 80s summarized in the following manner: “In my childhood we had ragi. Growing, harvesting, eating. No saving of money.”



Why is that so? In what follows, I will seek an explanation in the conjuncture of forces and processes on the ground that has rendered maize somewhat useful to the livelihoods particularly for rainfed farmers in Mekkenur.

## 5.1 | The rainfed dystopia and classes of labour

Indeed, the Hanur region fits the agricultural dystopia scenario well: Rainfed conditions have made farming increasingly risky and unprofitable in a context of unpredictable rainfalls. Informants in their 50s told me of life-long experience of failing monsoons but sharply deteriorating rainfall starting only in recent years. When I started fieldwork in 2017, the region was experiencing its first proper monsoon in 4–5 years. The years before had been dry. During this extended drought, whole villages had abandoned agriculture; lands were left fallow, and many villagers migrated temporarily to casual worksites from Bangalore to coffee estates in Kodagu.<sup>19</sup> The vagaries of climate extend even further: When it does rain, villagers held it to be all too common that it rains too much, for example, in heavy downpours reappearing after sowing, thus spoiling a good part of the crops. In nearby areas where there is even less irrigation than in Mekkenur, recent years' droughts saw whole villages being temporarily deserted.

The vagaries of climate indicate that livelihoods are far from dependent on agriculture. As in Harriss-White's (2008) characterization of the rainfed dystopia, labour dominates livelihoods in Mekkenur. The only people I met whom considered themselves to be economically benefitting wholly from agriculture were a few major landowners having around or above 10 acres of land. In Kannada these are known as *dodda raitharu*—big farmers. They were cultivating a wide range of crops on irrigated lands, including bananas and vegetables, which they considered the most profitable.<sup>20</sup> “Maize is not profitable!” dominant farmers would exclaim when I asked them for the reasons behind their cropping choices. To the extent that they grew maize, it was only on selectively apportioned parts of their lands—based on feeding livelihoods more indirectly. Whereas *dodda raitharu* had profit as their orientation in evaluating maize, other farmers emphasized that “at least we get something” from maize, unlike other crops with their fluctuating price rates. Agro-traders in Hanur calculated input and output costs for maize, matter-of-factly ascertaining that this “something” farmers get is a paltry sum. We therefore need to look beyond “profit” in explaining the everyday dynamics of the maize boom (see Richa Kumar, 2016). Let us start with labour patterns.

Dominant farmers were able to produce commodities profitably by employing agricultural labour (*kuli*), primarily in the form of inhabitants of Mekkenur hired on daily wages. Rainfed farmers only cultivate their lands for half the year or less, leaving them in a position where they can take up agricultural labour in the remaining months. Several dominant farmers would tell me that they prefer local agricultural labourers from the village as they can be paid less and are able to return to their own houses for lunch.<sup>21</sup> Local women appeared sought after as agricultural labourers as they were paid markedly less than men were (whereas men from the village were paid Rs. 200 per day, women were paid Rs. 120).<sup>22</sup> Dominant farmers would constantly bring up “the labour problem.” They talked about how, as one elderly Kuruba man put it, “as compared to farmers, agricultural labourers will get good income now.” Never actually backing up such remarks with any proof, dominant farmers conveyed a sense of frustration in such terms, as commercial agriculture demands investments in seeds, equipment, and labour—all overshadowed by the prospect of failing rains. Overlooking their lands where small groups of five to eight agricultural labourers would be toiling in the heat, I met several dominant farmers who complained about how agricultural labourers have turned “difficult to monitor.” If you try to press them to work harder, they simply leave, landowners complained. A number of respondents, including agricultural labourers themselves, described wages as having risen lately (women would confirm that their wages had increased from Rs. 120 to 150 per day only in the last 6 months). Although this predictably enough led to

<sup>19</sup>Many villagers told me that the rise, although still limited, in local land sales is linked to these recent droughts.

<sup>20</sup>The varied cropping patterns of big farmers were perceived by many to be a necessary corollary of the vagaries of climate in reducing risks. “If you have only one variety you can lose everything!” one big farmer said.

<sup>21</sup>Landowners told me that agricultural labourers from other villages were paid Rs 50 more per day—but I have not had this corroborated by labourers themselves.

<sup>22</sup>How this fits into a broader pattern of feminization of agriculture is beyond the scope of this article. For a recent overview of relevant literature, see Pattnaik, Lahiri-Dutt, Lockie, and Pritchard (2018).

complaints among dominant farmers, lower caste/class respondents held the view that wages presently are at such a level that rainfed farmers refrain from hiring agricultural labourers altogether, relying now on their household labour power entirely.

Across the class/class spectrum, all of this was perceived as related to changes to the agrarian system over the course of the last two generations. Where there was previously a sense in which dominant landowners had a certain command over lower caste/class villagers that included the ability to recruit them as agricultural labourers throughout the year, the present scenario was described as one in which this command has weakened markedly. Dominant farmers complained about increasing difficulties to get enough agricultural labour and a labour force that now complained or refused if they try to press the number of hours or the workload.<sup>23</sup> Lower caste/class informants, however, described a situation where localized domination has crumbled, allowing them to depart in search for other work if the conditions for agricultural labour locally do not fulfil their requirements. This is of course linked to changing labour markets and “incorporation,” in Harriss-White’s (2008) phrasing above, in a broader economy. This relates closely to the maize frontier. As a matter of appropriating paid and unpaid work, we find that the frontier is in important ways constituted by the majority’s incorporation in the wider economy as parts of classes of labour.

First, I did not find a single extended household that did not include an element of paid work. Dominant households in the village reported white-collar jobs, regular employment in banks and elsewhere, and small-scale business in Hanur (e.g., running restaurants or other shops) and income from legal and illegal practices running as “contractors” with close links to the local state.<sup>24</sup> There are also a handful of small manufacturing units (coir, silk, jaggery, and pani puri) in the village, all owned by Lingayats. Meanwhile, the majority of Mekkenur’s population reported on insecure, precarious, and shifting paid work. Clearly members of India’s growing classes of labour, the majority had agriculture as a component of a labour-oriented household economy. STs in the village reported on small-scale business both in Mekkenur (tea shops) and nearby Hanur as well as forms of labour migration—to Kodagu to work in coffee estates and, frequently, to Bangalore to work in construction, garment factories, and other casual work. SCs reported on similar employment patterns, only more starkly precarious, as local structures of caste domination work towards excluding SCs from regular employment in Hanur. Excluded from avenues that are open to STs, then, SCs have seemingly found labour migration more necessary, resulting in widespread reports of household members working in Bangalore and elsewhere. In line with what we know about India’s labour migrants at the bottom of the labour hierarchy (Bremen, 2010), Mekkenur’s low caste migrants also circulate. Although there were cases of people having sent their children for higher education and thereafter resettling, in group interviews with SCs and STs, I found that very few from their castes had resettled as a result of labour migration. With widespread circulation, I often found households consisting of a middle-aged couple, in many cases at least one of them doing agricultural labour on the lands of higher castes as well as looking after their own plots of land, as well as a daughter-in-law and children. The middle-aged couple’s own children were working elsewhere.

We should be careful in making assessments to the effect that the highly mobile working patterns observed were of recent nature. In her classic study that includes fieldwork in the late 1970s in a village south of Bangalore, Hill (1982) writes: “Under our dry grain mode a great proportion of households are obliged to follow non-farming occupations, their grain production being altogether insufficient for household needs and farm-labouring being a highly seasonal occupation” (pp. 141–142). However, village narratives suggest that the current situation in Mekkenur differs sharply from what went before: Informants in their 50s and above invariably told me of spending their lives up to adulthood in a village where people mostly worked on the land and where insufficient infrastructure and few social ties limited interaction with a broader economy. To me, it seems evident that this links to the Hanur region’s marginality, generative of patterns of agrarian change different from less marginal nearby parts.

This means that the incorporation of the majority of the village, and the lower castes with their primarily rainfed small plots in particular, as classes of labour brings challenges to agriculture—and thus to expanding any commodity

<sup>23</sup>Research from surrounding parts of South India, including Taylor and Bhasme’s (2018) recent work from Telangana, shows similar patterns of perceived “labour shortage.”

<sup>24</sup>These forms of employment among the dominant classes appear similar to what Pattenden has found in villages across Karnataka (Pattenden, 2016).

frontier on the ground. People's patterns of labour are mixed and shifting, only engaging in agriculture as part of a broader portfolio of income sources. Consequently, household members are often scattered across multiple locations. The land is inhospitable with its unpredictable and deteriorating rainfall. Yet the crop-specific properties of maize come in handy: It demands less labour and less water than do competing crops in the region. For locals in Mekkenur these properties of maize enabled even classes of labour owning small plots of rainfed land to continue cultivating while maintaining their labour-oriented livelihoods.

Compared with the traditional crop of ragi, for example, maize sowing is done with less density, making it easier to weed. Maize harvesting with manual cutting is done on the basis of either household or hired labour, depending on the size of one's holding. As mentioned above, rainfed classes of labour reported that they never hired labourers on their maize plots. Villagers explained that a farming couple can harvest 1 acre of maize in 1 day on their own. For threshing, people use what is locally known as the *mekkejola machine*; no labour-saving machinery exists for ragi.<sup>25</sup> Planting of maize happens in July/August (provided the monsoon does come) with harvesting on rainfed land after 90–100 days and on irrigated land after 110–120 days. This means that maize is a quick crop. For classes of labour, this is obviously useful: After harvesting, rainfed farmers can then proceed to do other work for the rest of the year, that is, up to 9 months yearly. Adding to this, recent patterns of labour mobility as well as overall monetization of reproduction in the Indian countryside have created a situation where all sections of villagers in Mekkenur are increasingly in need of cash. Middle-aged and older respondents emphasized a generational change in household dependencies on cash, for handling an expanding list of expenditures: Agriculture has become commercialized, demanding a steady stream of purchased inputs. School fees need to be paid, as children universally go to school, usually finishing at seventh standard, whereas while some also go to college. Villagers reported that expenses on weddings have increased. Houses are constructed, maintained, and upgraded. In short, the need for cash involves a plethora of daily as well as seasonal needs.<sup>26</sup> Again, maize comes in handy as a quick crop.

These crop-specific properties of maize have repeatedly been singled out as important in understanding the global expansion of the crop. "Planting corn," Braudel (1977) memorably wrote, "is surely the simplest and most convenient way to obtain one's "daily bread". It grows very rapidly and requires minimal care" (p. 12). Villagers were very vocal about this. "Maize is a good crop," said one ST man as he was grazing his sheep in the wastelands outside of Mekkenur. "It is easy to cultivate. No need to take care like other crops." In his classic *Corn & Capitalism: How a Botanical Bastard Grew to Global Dominance*, Warman (2003) elaborates:

*Corn's high performance is attributable to its adaptability, its high yields relative to other cereals, its low labor inputs, and its short growth cycle. All these factors go far in explaining why peasant producers prefer corn over other crops. The combination of these factors acquires special significance when producers are severely restricted in their access to resources, restricted in the amount of time that they can wait to have food or obtain income, and restricted by conditions of poverty. (p. 94)*

In Mekkenur, maize came into competition with ragi, which demands more labour, has less secure market, and has lower yields as well. Respondents would emphasize that ragi only brings 5 quintals of yields per acre, which they calculated to be insufficient for making any profit, hence useful merely for food. Maize would yield up to 20 quintals per acre on rainfed land. An elderly SC man in his 80s, who grows maize with his two sons on their 2 acres of land, narrated the impact of these factors to his household's needs as follows:

*Now if my grandfather had given more land, we would have had more agriculture. But only we have 2 acres land [...] I am using maize in that. If I cultivate maize in my land I am getting 40 quintals. Instead of that if I cultivate ragi only 10–15 quintals ragi will be there. But maize I can grow more compared to ragi. Maize can be grown in maximum. With this I am taking care of my family and I am looking after my children and*

<sup>25</sup>Farmers would rent the machine, most commonly from big farmers who own these, for Rs. 75 per quintal. The machine is then connected to a tractor engine for running. There were four tractors in Mekkenur, and more could be rented in nearby Hanur.

<sup>26</sup>For discussions about rural India's relationship to cash and the increasing pressures this exerts on farming households, see Vasavi (2012).



**FIGURE 6** Cows grazing on maize straw in Mekkenur. Photo by the author

*my health. In this way I am leading my life and spending my time [...] Whatever that may be in the agricultural land I am taking that. And apart from that I am working as agricultural labour and I am making 300 rupees. Daily 300 rupees I can get. I have cows and sheep, with that I will sell that milk and will get some money. My wife is also helping me to grazing and working in farm also. In my family everybody has to work. Otherwise it would not be possible to maintain life [...] See, I have two sons, they are also helping me. Apart from that I am going for grazing sheep. And we'll take milk from cows. And sell it for dairy. Like that my family is managing.*

Having seen the influence of everyday patterns of paid work for the construction of maize as a commodity frontier in Mekkenur, let us take a cue from this man's mention of livestock and women's work and move on to look at the way the maize frontier interacts with unpaid work.

## 5.2 | The multiple uses of maize

In addition to the factors described above, Warman (2003) also notes maize's special ability to grow alongside other plants as well as its multiple uses as food, feed, and fuel. This makes it a crucial flex crop (Borras, Franco, Isakson, Levidow, & Vervest, 2016) not only at the scale of the global political economy but also in everyday livelihoods. How does this play out in Mekkenur?

Dominant farmers were not the only ones to doubt the profitability of maize. For rainfed farmers, the "gamble," as many put it, of erratic rainfalls weighed heavy.<sup>27</sup> As one ST man said, "farmers can't know whether they will get benefits from maize in advance. It's like education—you won't know whether you'll pass." Yet compared with those for other crops, people emphasized that price levels fluctuate less in a context where demand from the poultry industry is high.<sup>28</sup> The price paid for selling maize for the industrial grain–oilseed–livestock complex is only part of

<sup>27</sup>For discussions of agriculture as "gambling" in India, see Münster's (2015) work.

<sup>28</sup>Farmers pinpointed the minimum price needed to avoid losses in maize at Rs. 1,500 per quintal.

the story, as respondents' constant references to livestock made clear. "Their main motivation is livestock," Hanur's most experienced agro-shop dealer told me repeatedly. Similarly, a Kuruba farmer with 4.5 acres of land who grows bananas said that "there are no benefits in maize. We are only cultivating maize for livestock. For that only purpose we are growing maize here." Big farmers with irrigated lands tended to keep maize straws in heaps on their properties. Next to these, they would keep their cows by a shed or in the shade under a tree (see Figure 6). Next to houses in the village, too, heaps of maize straw were found next to the houses of the more prosperous villagers (I mainly found these heaps around the Lingayat section of the village, where there is more space next to houses) in order for them to feed their cows nearby as well. Others, with less space for keeping straw mounds by their houses, would keep maize fodder in sheds by their houses to feed their cows.

In commodity frontier terms, all of this point to what Camba (2018, p.4) describes as the "nexus of paid and unpaid work." The expansion of maize draws conjuncturally on its crop-specific ability to "feed" into a broad spectrum of livelihood needs in Mekkenur. Middle-aged women as well as their daughters-in-law would do a lot of the work of feeding, washing, and milking cows near to their houses. Milking could also be done after finishing the day's paid work. As agriculture has become increasingly risky, precarious, and unprofitable, villagers perceived the livestock economy as a safer option.<sup>29</sup> I discussed the livestock economy with informants across caste/class lines throughout my fieldwork and found clear trends: The largest farmers who were reporting accumulation from agriculture did not keep much livestock, as they deemed it too expensive to maintain by hiring labour. Medium-sized farmers, mostly among Lingayats and Kurubas, were found to have two to six cows, with those having more than two professing the ability to accumulate some money from selling milk. Rainfed and other small farmers, on the other hand, were reporting one to two cows per household, not enough to profit from selling milk beyond contributing to covering household needs.<sup>30</sup> Local experts on the livestock economy—including a veterinary and the manager of the village dairy—explained that labouring class households could not possibly afford more cows than that. With the cost of purchasing a cow at Rs. 15,000, such households would have to take loans, most commonly from local self-help groups. Repaying loans—not only for purchase of livestock but also for household loans more broadly—was commonly a main use of milk money, as women respondents in labouring class households explained. Without the source of feed from maize, it would have been difficult for them to maintain this, albeit small, stream of income. In other words, barring the *dodda raithuru* whose cropping patterns steer towards higher value crops apart from maize, the livestock economy appeared important across the castes in Mekkenur, although in ways differentiated along caste/class lines.

Adding to this conjuncture is the fact that the region has for the last 10–15 years seen the appearance of new breeds of "hybrid cows." These produce more milk than do the local varieties of cows. Crucially, they do not eat ragi, but they "love" eating maize, as villagers would put it. Unlike the local variety of cows, hybrid cows do not need grazing, allowing households to keep their cows under the watch of daughters-in-laws, not affecting their ability to engage in other work.<sup>31</sup> Agricultural labourers would often keep their livestock tied in the shade of some trees while working in the field. Although both men and women were involved in the everyday activities of tending for livestock, numerous respondents emphasized that women have a particularly important role in such regard. For example, one middle-aged SC woman explained her role one evening as we were sitting outside her house as she was milking her single cow. A rainfed household with 3 acres of land where they grow maize as well as ragi and horsegram, she explained that the economy of the cow is crucial to their livelihoods. Women take care of the cows, she said, often with the help of their children when they are not in school. Key here is the fact that milk sales are a quick source of cash. As Hanur's livestock veterinary told me, the cow is a "quick source of income, income per week, as compared to crops, where you have to wait." An experienced agro-trader in Hanur said that "profit from maize is only for family

<sup>29</sup>It is worth pointing out that the turn towards increased importance of livestock and dairy production is part of a broader Karnataka-wide pattern and that this has been fostered, in part, by policies implemented by Siddaramaiah's Congress government in the years 2013–2018.

<sup>30</sup>Villagers sold milk in a dairy cooperative that has a station in the village itself. Here villagers would sell milk for Rs 27/L.

<sup>31</sup>By way of contrast, local cows were reported to demand one person to graze 10 cows full-time. These shepherds are no longer available in the village.





**FIGURE 7** Working in the castor “forest”/maize field. Photo by the author

maintenance. They can't purchase land, can't put their children to good schools or colleges. They can't save money from that. Only from milk they can save some.” Adding to this, in times of monsoon failure, the livestock economy would provide at least some backing for households. All of this makes maize a perfect fit for the present conjuncture in Mekkenur.

The crop-specific properties of maize go even further in allowing for its integration in villagers' livelihoods in ways involving the appropriation of paid and unpaid work/energy. As Warman (2003) noted above, maize grows very well with other crops. In Mekkenur, this has been taken advantage of by intercropping maize with lablab beans (*avare*) and castor. These were formerly intercropped with ragi. Whereas the irrigated crops do not intercrop well,<sup>32</sup> rainfed farmers would be intercropping with maize in order to provide an “added” value to the land.

Take, for example, a young SC man who has 2.5 acres of rainfed land. When I came across him in September 2017, maize covered his land fully. When I then met him in March 2018, he was harvesting castor and *avare* from morning to evening from what was by then a veritable forest (see Figure 7). While harvesting, he would tie his cows to some of the trees. Harvesting together with his elderly father, he would not hire any agricultural labourers. The castor he would sell in Hanur, whereas the *avare* was for household consumption. He held that the intercropping of castor and maize gives a particular synergy in that castor yields better when intercropped with maize, not with other crops. Referring to the oil made from castor that one puts on one's head to cool the body, he explained that, similarly, castor would “cool” the land and give good yield in maize. Although these intercrops do demand some additional labour after the end of the maize harvesting season, I found that Mekkenur's castor and *avare* “forests” would be mainly visited by women. Such multiple uses of maize thus tie intimately to the configuration of work patterns among labouring households in ways conducive to the making of maize as a food regime frontier.

<sup>32</sup>In irrigated agriculture, farmers explained, the intercrops would grow too fast, causing problems for the maize. Moreover, irrigated farmers would plant a new crop after harvesting, which is ill-compatible with intercrops.

## 6 | CONCLUSION

This contribution has explored the everyday dynamics of the contemporary food regime through a fieldwork-based case study of booming maize cultivation in Chamarajanagar district, Karnataka, South India. Through this case, I have been seeking to contribute to recent scholarship that calls for reworking food regime analysis to be able to account for cases below the “global” level, including regional, national, and even local cases (McMichael, 2013; Otero, 2016; Otero, Pechlaner, & Gürcan, 2013; Rioux, 2017; Wang, 2018). Taking the industrial grain-oilseed-livestock complex (Weis, 2007, 2013) as a key site of ongoing food regime restructuring, I have argued for seeing the expansion of maize as an apt example of the integration of new crops and regions, or expansion of, the contemporary food regime. Such integration happens, I have further argued, through commodity frontier (Moore, 2015) dynamics, drawing upon the appropriation of paid and unpaid work. I have showed how maize becomes a commodity frontier at the intersection of processes from above and from below. The maize boom is pushed from above as the industrial grain-oilseed-livestock complex expands into the region through the poultry industry and the corporate-driven hybrid seed sector. It also happens from below as villagers are able to integrate the crop in their broad livelihoods in ways that cross, while also differentiating along, class/caste lines. Focusing particularly on lower caste/class villagers, I have argued for seeing their livelihood patterns as part of India's classes of labour (Bernstein, 2006) oriented towards wage labour. The crop-specific properties of maize make the crop useful for these livelihood needs in ways that go beyond profitability, strictly speaking. In particular, I show how classes of labour make use of maize through its relatively low labour requirements, its ability to grow in semi-arid environments, its usefulness as feed for livestock economies, and its usefulness for intercropping. In all these ways, the maize boom in a southern Indian village allows us to explore the everyday dynamics of the contemporary food regime.

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