

**International
Institute of
Social Studies**

Erasmus

**The Dual Role of Debt in Concealing & Sustaining an
Agrarian Crisis-in-the-Making
Insights from a case in South Gujarat**

A Research Paper presented by:

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in partial fulfilment of the requirements for obtaining the degree of
MASTER OF ARTS IN DEVELOPMENT STUDIES

Major:

Agrarian, Food, and Environmental Studies
(AFES)

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The Hague, The Netherlands
November 2023

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Acknowledgements

I owe a debt of gratitude to several people without whom this paper would never have been possible. First and foremost, I am indebted to the many Vasava farmers and other respondents who welcomed me, made time to talk, and shared their experiences and opinions with such openheartedness. To them, *toma kbub aabbar*. A special thanks here goes to Pia, my (anonymised) research assistant, who showed me around, thought alongside me, and hosted me in her home. I am deeply grateful to Purvi Vyas, not only for helping me arrange this research in every way possible, but also for helping me learn from her own experiences as a farmer and working with farmers.

I have been lucky to have Dr. Julien-François Gerber as my supervisor for his enthusiasm for this topic, the amount of time and patience he took out to guide me, and the many insightful discussions over the subject and its various tangents. I am thankful to him, as well as my second readers, Dr. Luisa Cortesi and Dr. Oane Visser for their helpful comments. Additionally, I am appreciative of the feedback from peers in the many conversations had leading up to the deadline.

Lastly, I am deeply grateful for my three pillars along the way: Charlie, for entertaining my excited rants and helping me mind-map over cups of tea, Shivayan, for his support in every possible way, and my mother, for everything said and unsaid.

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List of Acronyms

Bt	<i>Bacillus thuringiensis</i>
GM	Genetically modified
GR	Green Revolution
ST	Scheduled Tribe
CPR	Common property resources
SSP	Sardar Sarovar dam project
KVK	Krishi Vigyan Kendra
EMI	Equated monthly instalments
SHG	Self-help group
NPA	Non-performing asset

Abstract

Situated within broader debates around biotechnology and indebtedness in agriculture, this paper explores the use of credit/debt in the adoption of genetically modified Bt cotton by Adivasi farmers in South Gujarat. The study focuses on three aspects vis-à-vis agrarian debt: its relationship with agricultural practices, its interaction with class and caste, and overall, its role within the ongoing agrarian change in the region. By employing a qualitative ethnographic methodology in a region which has adopted Bt cotton relatively recently, the study reveals insights into important mechanisms of agrarian debt and its evolution. The data indicates a cyclical and reinforcing relationship between Bt cotton and credit. However, the burden of debt and risk is experienced differently based on one's class and caste position, indicating a complex debt-class-caste nexus. Based on the climate-related damages and increasing unaffordability in the studied area, I argue that debt plays a dual role in concealing and sustaining an agrarian crisis – firstly, that it conceals a crisis-in-the-making, and secondly that it sustains the crisis by placing the brunt on individual households. The study therefore identifies debt as a crucial point for future study in the making of agrarian crises.

Relevance to Development Studies

With increasing importance placed on 'financial inclusion' and credit access within the agrarian sphere, this research paper is relevant because it explores the consequences of such developmental approaches. The study provides an empirical account of how farmers are affected by such financial programs, and in doing so, contributes to theoretical and practical debates in the way agrarian financial development needs to be considered.

Keywords

Agrarian debt; credit; biotechnology; Bt cotton; agrarian crisis.

Chapter 1

Introduction

1.1 Research Problem

In the pursuit for higher cotton yields in India, the shift to genetically modified seeds has received much attention as an especially strong strategy. Such discourse centres around the desire for growth and productivity, but also poverty reduction for smallholder farmers (Shah, 2005). Consequently, the promise of *Bacillus thuringiensis* (Bt) cotton is one of freedom from pests and insecurity, and the potential to lift oneself out of poverty. However, much alarm has been raised for the ill-effects of Bt cotton – with rising ecological degradation, farmer indebtedness, and suicides – but this remains a polarised debate (Gruère & Sengupta, 2011; Plewis, 2014). Within this debate, an often-cited success story is that of Gujarat, a state in Western India which played a key role in this technological transition (Shah, 2010). Here, the technology was adopted in the early 2000's by wealthier, upper-caste farmers in North Gujarat who thrived with this cotton variety, much in the way they did during the Green Revolution (GR).

This success, however, has been attributed to three specific factors which are highly intertwined with these farmers' caste and class positions (Shah, 2005). Belonging to the dominant agrarian Patel caste, they firstly have a strong social network which also works as a credit base. Secondly, they receive remittances from relatives who have migrated to other countries. And lastly, they depend on cheap migrant labourers from *Adivasi*¹ communities in neighbouring areas. Here, it becomes visible that farmers that have come out successful from this technological transition largely belong to groups of higher class and caste positions, granting them not only more wealth and resources but also access to cheaper labour (ibid.).

Despite this, a notable shift unfolding in the last decade is that Adivasi farmers have also started adopting Bt cotton within their own production (McKinney, 2013). Situated within these strong caste²/class power asymmetries, this shift points to a significant issue. Namely, without access to the aforementioned three factors which upper-caste farmers rely on, how do Adivasi farmers finance this technological transition? Research in the early stages of this transition makes evident the relatively weaker agrarian position of Adivasi farmers, who often have to depend on agents and middlemen with higher bargaining power, and work with certain types of contract arrangements or conditional credit options (ibid.). The role of credit here becomes of interest, not only because technology adoption has long been associated with indebtedness (and its own consequences), but also because credit/debt relations unfold atop existing material and social relations.

The relationship between debt and caste relations has been explored in the agrarian realm both empirically and theoretically, but the majority of this work examines the pre-

¹ *Adivasi* literally translates to “original inhabitants”. This word is not officially used by the government, who instead use the term ‘Scheduled Tribes’. Here, there is a politics of naming at play (see Baviskar, 1995; Dasgupta, 2018). I intentionally use the word Adivasi here since it is the chosen word by the respondents in the study. It is important to note that Adivasi is not a homogenous population, but instead includes several different groups (such as Bhil, Dhodhia, etc.). I specify the specific group of Adivasi where possible to avoid homogenisation.

² It needs to be distinguished that Adivasis are not categorized within the Hindu caste hierarchy either historically or in the present (Dasgupta, 2018). While acknowledging this, I still use a caste lens here because power relations are strongly set along the lines of caste upon which agrarian relations have historically been built (Jhodka, 2022).

liberalisation period. Some notable examples include Breman's (1994) detailed accounts of attached labour relations, Brass' (1986, 1999) theorisation of unfree and bonded labour, and Patnaik and Dingwaney's (1985) edited volume on relationships of servitude. These works explore the crucial role of caste in the making of debt-based agrarian relations during their time. However, agrarian contexts have undergone significant changes since then – most visibly with the neoliberal turn of agriculture (Dhanagare, 2016). The role of debt within caste and class relations thus becomes of theoretical importance within the evolving agrarian landscape.

Since credit is positioned here between several agrarian issues – that of class, caste, and the shift towards more capitalist forms of production – I take it as the central interest in this paper. The research objective is thus to explore the role of credit in this agrarian context and its interplay with existing class, caste, and power structures.

The research question which follows is: *How are the different facets of credit and debt shaping the agrarian Adivasi communities of South Gujarat?* From this, the derived sub-questions are:

- i) How do credit/debt and agricultural practices influence each other?
- ii) How does debt interact with caste and class relations?
- iii) What is the role of debt within the ongoing agrarian changes in the region?

Research in this area is relevant at different levels. First and foremost, it allows for an understanding of how people themselves understand and interact with new credit relations. It is important here, however, to reject the problematic notion that Adivasi farmers are 'untouched' by capitalist and financialised systems. Instead, I explore the new credit relations during this technological transition within existing agrarian relations. In doing so, this research is theoretically and practically relevant in understanding how credit interacts with not only class but also caste dimensions in agrarian change. Lastly, this contributes to a larger debate around biotechnology and debt from a specific and nuanced context.

1.2 Literature Review

Debt has long been a part of the Indian agrarian context and has been a topic of study for at least a century (Darling, 1928). Accounts of 'the Punjab peasant in prosperity and debt' from the 1900s illustrate the cyclical and widespread existence of debt among various classes of farmers, with 83% of cultivators having some sort of debt (ibid.). Since debt relations tie many farmers to moneylenders, and tenants and servants to landholding farmers, the credit/debt dyad can be seen as an important thread holding the matrix of agrarian relations together. This fits within broader conceptualisations of debt by Graeber (2009; among others), who argues that debt is not only a financial obligation but has been historically intertwined with social and cultural relations. This section therefore explores agrarian debt and how it relates various agrarian classes and castes to each other at specific periods of time. In doing so, it provides a brief history of agrarian relations in India, as well as a glimpse into key temporal windows such as the green revolution, liberalisation, and the introduction of biotechnology.

1.2.1 The Green Revolution

Although being in debt was not uncommon among various cultivator groups up until the Green Revolution (GR), this period altered both the extent of indebtedness as well as its distribution amongst different classes and castes. With the implementation of GR technologies in India in the 1960s (Frankel, 2016), a clear exponential increase in agricultural credit is seen from the 1970s onwards (Satish, 2006). The credit/debt dyad was a present

factor for farmers of different landholding sizes but affected each group differently. Between landholding farmers, GR technology adoption disproportionately squeezed out small and marginal farmers (Dutta, 2012; Frankel, 2016; Shiva, 2016).

This has been attributed to their inability to meet the economies of scale necessary to pay off the initial credit required for investment (Satish, 2006; Singh & Toor, 2005). GR technologies favoured wealthier farmers with larger handholding, and the process of squeezing out led to a consolidation of land in the hands of fewer farmers. The favoured farmers often belonged to dominant agrarian castes as well, such as the Jatts in Punjab (Satish, 2006) and the Patels in Gujarat (Shah, 2010). Together, these highlight growing class- and caste-based asymmetries in who owned land and how much.

The evolution of labour relations is more complex, since these have historically been rooted in caste hierarchies (Patnaik & Dingwaney, 1985) and often sedimented by unpayable debts (Breman, 1994). While degrees of unfree labour were prevalent before the GR, Brass (1999) points out how this period influenced bonded labour relations. Specifically, he argues that the sharp labour shortages during this period were remedied by creating relations of debtor/labourers and creditor/employers. Moreover, these were often people from Adivasi and lower caste positions who migrated for seasonal work and entered such labouring agreements (*ibid.*). Overall, this period saw a decline in real wages for labourers (Patnaik & Dingwaney, 1985), and therefore created a widening gap between landed and labouring classes (Breman, 1994).

Further, these agrarian relations are constructed upon material differentiations on caste, as is visible with upper-caste farmers as the usual (large) landholders and the tradition of bonded labour along strong caste-ist lines. Credit and caste thus have an important historical overlap in sustaining agrarian relations in the Indian context, especially as both create situations of labour attachment rooted in degrees of unfreedom. This is also visible in the replacement of caste-based bonded labour being transferred and inherited as debt-based bonded labour between generations (Brass, 1986; Brass, 1999). These legacies are important to keep in mind when interpreting present-day contexts since agrarian relations continue on trajectories of such power asymmetries.

1.2.2 The Neoliberal Turn

From this context, the 'neoliberal turn' witnessed key developments in debt and agrarian relations (Walker, 2008). Marked by the package of economic neoliberal policies adopted in the 1990's, the neoliberal turn can be situated within a larger project of liberalisation (Dhanagare, 2016) which consequently reorganised Indian agriculture. Deregulation triggered a shift from previous public control over agricultural development projects to the private sector taking ownership (Brooks, 2005). The reigns of the GR and agricultural technology were passed onto corporate interests in growth and productivity. Such reforms affected all segments of farmers as they struggled to compete in an open market system without protections and amidst increasing costs of production (Dutta, 2012). Consequently, there are many concerns about the increase in indebtedness and farmer suicides being caused by liberalisation policies (Kennedy & King, 2014).

While the neoliberal turn has been celebrated for catalysing economic growth, this growth has been linked to increased exploitation of rural peoples, farmers, and lands (Walker, 2008). In her work, Patnaik (2007, 2008) refutes the favourable official statistics to show that both food insecurity and rural poverty had increased after liberalisation. To illustrate, she calculates rural poverty to be at almost 75%, while officials estimates only 27.4% (*ibid.*). Patnaik (2007) specifically attributes these figures of worsening rural conditions to economic liberalisation. The rural and agrarian distress was followed by periods of labour out-

migration, livelihood diversification, and indebtedness, which Mishra (2020) says has created “a crisis of survival for cultivators and agricultural labour households” (p. 183).

Moreover, an important differentiation in the effects of liberalisation is seen with the increased exploitation of specific groups, namely, Dalits and Adivasis due to their systematic dispossession and subjugation (Bhaduri, 2008). Referring to this, Walker (2008) argues that the agrarian crisis is not born out of neoliberalisation alone but is entrenched in historically unequal land division and labour relations. Serving urban interests at the expense of rural populations and specific marginalised groups, Walker (2008) therefore terms the agrarian crisis as an “internal colonisation of the poor” (p. 579), showing a continuation, if not exaggeration, of class- and caste-based hierarchies.

An agrarian crisis has thus been in the making for the last few decades, with serious problems of farmer suicides, deaths by hunger, increased poverty and migration levels, and ecological concerns for soil and water (Mishra, 2020; Walker, 2008). It is within this context that biotechnology has been proposed as a solution for increased productivity and poverty reduction. However, biotechnology comes with its own considerations, making it the centre of a polarised debate (Gruère & Sengupta, 2011; Plewis, 2014).

1.2.3 The Introduction of Biotechnology

The widespread adoption of GR technologies provides fertile grounds upon which genetically modified (GM) discourses seem to thrive (Brooks, 2005; Shah, 2008). Most visibly, pro-GM discourses call on a revival of distinct GR discourses centring around neo-Malthusian concerns (Goodman & Redclift, 1991). Further, these concerns are specifically associated with the need for technological solutions to intensify production, i.e., a supply-side solution. What remains to be considered, however, is how these technologies affect rural households who are already caught within an agrarian crisis.

Studies exploring the socioeconomic effects of Bt cotton production on rural households indicate certain concerns, especially due to the correlations between Bt cotton adoption and farmer suicides (Gutierrez et al., 2015). Bt seeds must be purchased each year and must be supplemented with increasingly input-intensive practices. This, coupled with a lack of price assurances, has socioeconomic consequences for farmers. To understand this mechanism further, it is necessary to explore the basics of how Bt cotton technology works.

The most notable aspect of the Bt cotton seed is its genetic alteration to protect itself against one class of pest – the pink bollworm, or *Bacillus thuringiensis* which it is named after (Sethi, 2021). Due to its self-protection from this pest, the initial years of Bt cotton production require lesser pesticide and provide higher outputs (Najork et al., 2022). However, pest attacks become of increasing concern after these initial years and necessitate record-levels of pesticide use (Kranthi & Stone, 2020). This is firstly because Bt seeds do not protect against other pests. Secondly, because of the evolutionary dance between host and pest, the pink bollworm can evolve to defeat the seed’s protective mechanism, thus rendering the Bt seed ineffective (Najork et al., 2022).

Further, each Bt cotton seed holds within itself patented intellectual property in the form of genetic material. To protect this property owned by agro-companies, Bt cotton seeds in India are manufactured as hybrid seeds³. This inhibits the pest-resistant genetic material

³ India is the only country in which Bt seed is created as a hybrid variety. Generally, Bt seeds are ‘straight-line’, i.e., not hybrid, so its seeds can *technically* be saved for a successful next generation. This is, however, strictly prohibited by legal measures of agro-companies. Since such legal measures would be near-impossible to implement and regulate with the sheer number of Indian farmers, intellectual property is protected by creating it as a hybrid seed instead (Sethi, 2021).

from completely passing onto the next generation of seeds, thus producing a less effective generation (Sethi, 2021). This has implications for farmers, who can no longer continue seed-saving but must buy seeds each year. Further, it determines which kind of farmers will perform better with it.

Working atop neoliberal structures, and as a neoliberal technology itself (Najork et al., 2012), the launch of GM seeds involves a large array of specialised actors and with the goals of economic growth and productivity. The specialised actors here include not only companies and financial institutions, but also seed sellers and agents who often sell inputs on credit and have even started acting as unofficial moneylenders (Dhanagare, 2016). Many farmers have also fallen into debt traps (ibid), which are attributed to Bt cotton production being cost-heavy and also carrying high risks (Kranthi & Stone, 2020). While Bt cotton technologies are said to be scale-neutral (unlike GR technologies), the on-ground realities are being debated. Amidst accounts of high farmer indebtedness and suicides in Bt cotton producing areas (The Sanhati Collective, 2012), the relation between biotechnology and debt is therefore relevant to explore further.

1.3 Theoretical Framework

The credit/debt dyad has been theorised within multiple disciplines, with focus on both material and moral consequences. In putting forward a history and theory of debt, Graeber (2009, 2012) revives debt as a topic of academic interest by highlighting its deep relations with exploitation and violence, and situating it within larger sociocultural ties. The question of debt and exploitation has also been explored by Marxian political economy scholars and critical agrarian studies. While Marx identifies interest as another form of value creation, in addition to profit (as cited in Gerber, 2014), Banaji (2010) later expands on its appropriation in the borrowing and lending of money. This is because of the interest which needs to be collected, which is paid by the borrower intensifying and thereby increasing production. Because of its resemblance with the way wage labour works, he refers to this as a ‘concealed wage’ (Banaji, 1977, p. 34). By charging interest rates on loans, credit relations can therefore be used to extract surplus value from small producers.

Roseberry (1978) formulates this along similar lines and identifies surplus value creation and exploitation in the same format of $M-C-M'$ as Marx does in *Capital*. Here, he argues that merchants purchasing a set of commodities before their production (in the form of a loan), and then later selling them for a higher price, constitutes a similar $M-C-C'-M'$. Exploitation in such ways is furthermore related to social differentiation, i.e., reconfigurations of agrarian classes. The role of debt here has been theorised by Bernstein (1977), where farmers are unable to meet the resources for reproduction and/or are affected by shocks, and therefore fall into a debt trap. This is termed as the ‘simple reproduction squeeze’ which results in medium farmers differentiating into poor farmers (Bernstein, 2010, p. 108). Attention has also been given to credit in situations of bonded labour (as mentioned before) as a way to sustain certain degrees of unfreedom, and therefore maintain relations with employer/creditors (Brass, 1999).

Additionally, the increase in agrarian finance over the years shows the insertion of farmers into global agricultural and financial markets. The prioritisation of financial motives and actors highlights the financialisation of agriculture (Clapp & Isakson, 2018), thus bringing into question the power relations denoted in borrowing from formal institutions. Financial geography pays attention to the functioning of such financial markets and the actors within it, and thereby investigates agrarian finance within this context. Green (2022a) turns to financial ecologies as an approach to chart out the various actors and their power

relations, which allows for an exploration of how agrarian households are inserted into the larger global financial system.

The role of credit/debt can thus be placed within the larger evolution of capitalism through a combination of its effects of social differentiation, disciplining, and hollowing out social and environmental relations (Gerber, 2014). Its role in disciplining borrowers is especially insightful into how it can promote certain intensive or productive rationalities, and thereby implicitly carry on logics of capitalism. It becomes evident here that debt which not only functions at the level of social movement and selection, but also extends to being felt at the levels of bodies, homes, and lands. Cavallero & Gago (2021) therefore call for debt to be made visible in its effects as a refusion of how abstractly it is often portrayed. This creates a shift from larger macro processes to the everyday lived experiences of people.

In mapping the experience of indebtedness, it is also necessary to keep in mind the other side of the coin – i.e., credit, since this is what provides a potential for future benefits (Gerber, 2014). Thus, the credit/debt dyad has a complex relationship with freedom, as debt may make discipline or constrain one while credit may offer the potential for future freedom (Graeber, 2009). It is this possible potential of which makes credit appealing in the first place, which must therefore not be dismissed in an individual's decision to take on debt.

Based on the literature and context of the research problem, I come up with three working hypotheses. Following Burawoy's (1998) extended case method (as explained in the methodology below), these working hypotheses are purposefully bold so that I can work to refute them during fieldwork and 'reconstruct' theory. They are as follows:

H1: *credit and Bt cotton is a vicious cycle*

H2: *material differences based on caste and class are rooted in debt relations*

H3: *credit is central to the unfolding agrarian change*

These serve only as a guideline to be reconstructed during the process of fieldwork.

For the purposes of this paper, I will draw from these rich theoretical backgrounds of credit/debt, albeit by confining it for the sake of scope. Since current agrarian relations are set in socio-historical contexts, I first trace histories of land ownership in this region. This provides crucial background in answering the second and third sub-questions. Embedding credit/debt relations in its socio-historic context requires acknowledging the plurality of debt relations as explored above – differences between landed groups and labour, various sources of lending, and more-than-monetary types of debt. These will be conceptualised with reference to work by previous scholars but also based on context-specific insights.

In addition to following debt for its material and moral dimensions, I also conceptualise debt in its embodied experience by people. I propose to follow how debt is perceived by people – in how they understand it, respond to it, and make decisions. While the perception and disciplining nature of debt is an extensive subject in and of itself, my goal is to not exhaustively explore it, but to bridge the gaps between lived experience, 'micro-processes' (of individualised debt), and larger agrarian change. With these interlinked approaches, I aim to understand the consequences of credit/debt in this region.

1.4 Methodology

To embed credit/debt in larger social contexts and to explore the various sources and understandings of debt from the peoples' own experiences, I turn towards qualitative ethnographic research. Since I ground myself in the rich theoretical framework of previous authors, I specifically build off of Burawoy's (1998) extended case method. Burawoy emphasises the importance of starting with theory, so as to identify relevant vectors when

conducting ethnographic research (Wadham & Warren, 2014). The purpose of starting with theory here is to be able to reconstruct it based on field findings, not by trying to prove theory but by trying to refute it (ibid). This informed the way I approached the “field” – by seeing my conversations with people as an intervention in itself, by working to refute the working hypotheses set out before, and most importantly, by centring people’s experiences to reconstruct theory on agrarian credit/debt.

However, an important element in the extended case method is the extension of observations over a period of time, i.e., following a “case” for a long duration. This was not possible given the scope of the study, and also proved to be logistically challenging. Since this is an important pillar of Burawoy’s (1998) method, efforts were made to compensate for the shorter duration of fieldwork. Specifically, elaborate conversations were had about the way of life over an entire farming season vis-à-vis farming practices and financial decision-making. More importantly, the research assistant was able to fill such gaps about longer term observations with crucial insights. Further, I turned to key informants (KI) who have worked in this area over extensive periods of time: KI1 who has spent a year doing ethnographic work in the region in 2001 and has been active with research and activism for the last two decades, and KI2 who lived in the area for 5 years and subsequently spent the last few years working with the region’s agrarian issues.

Since key informants also inform ethnographic approaches (Hammersley & Atkinson, 2007), the inputs and insights from these three crucial people allowed for a stronger methodological foundation. Hence, even despite the shorter duration of fieldwork, substantial data was available to answer the research questions based on: observations from being immersed in the villages, conversations with farmers about everyday experiences, and in-depth insights from informants and the research assistant provided substantial data to answer the research questions.

1.4.1 Study area

The villages to visit were chosen based on the prerequisites of them being predominantly Adivasi land and that Bt cotton was being grown, at least to some extent. Out of those short-listed, the chosen area was based on having good access, since this was crucial within a small timeframe. Based on her contacts from many years of working in the area, KI1 put me in touch with a farmer to help me with translation and transportation. This farmer, whom I anonymise as Pia, ended up being more of a research assistant since she took part in the research actively and contributed greatly. Before starting with our fieldwork, Pia and I had a few conversations to discuss what the research was, get acquainted with each other, and make a rough plan for how we would want to plan our visits.

The studied included a few neighbouring villages and a central small town, which I altogether anonymise as *Rabesa*. The small town was once a village, but grew with stores, jeweller’s, markets, and banks in the last 10-15 years. All of the villages were inhabited by Vasava people, a subgroup of the Bhil tribe. Hence, I refer to them as Vasava from here on instead of the general word Adivasi. Of the villages, each village had a slightly different dialect of the Vasava language, but people nevertheless understood each other.

Due to logistical challenges with transportation and accomodation, the total duration of ethnographic work was 10 days in August, 2023. Of this, I spent a first trip of 7 days in the town, and then returned two weeks after to stay with Pia in her village, who was very generous to host me. While I had assumed that the first trip would only be to get acquainted with the people and for them to feel comfortable with me, I was surprised by the depth of conversations had in this period. After this first trip, there were only a few minor gaps to

cover, given the scope of this paper. I was able to do this during the second visit and with the help of the key informants and Pia.

1.4.2 Collecting ‘data’ in everyday encounters

I reached out to farmers first through the households that Pia knew, and then through snowball sampling. To avoid having a homogenous group of conversations, we also walked through areas unknown to Pia and knocked on doors. Additionally, certain areas were purposefully chosen to meet people who had not yet been represented. This included going out to farther villages to meet households who had been relocated, and households belonging to the weaver community (mentioned further in Demographics). Based on farmers’ mentioned lending sources, I also went to sites of credit to speak with bank managers, store-owners, etc. Together, these strategies allowed for a diverse range of conversations. A list of respondents along with their basic characteristics is in Appendix A.

Data collection included having “conversations” with farming households, resembling semi-structured interviews. I call them conversations here since they consisted of informal visits to homes and sometimes fields, and because they were never with a single farmer but with multiple household members together. These were deliberately not set up as interviews but usually involved people hosting me and the research assistant, sometimes over cups of tea, to talk about everyday life. This also followed a more natural exchange, since people also asked me questions about my life and experiences. Since the research focus was not devised along with the people but was instead my own, I was honest with everyone about my research and did not try to conceal it. This was inspired by Sathyamala’s (2022) ethnographic research, where she resolves the same dilemma by choosing to be fully transparent with the people.

Conversations therefore started with the customary pleasantries, exchanging names, introducing myself as someone who wanted to do research with farmers in the region, and very clearly explaining that I was not tied to any government body, bank, company, or NGO. Pia would also introduce herself, which village she was from, and the jobs she did, but she would also explain that I did not come any of the places she worked at. I would explain my interest in doing research, that it was independent, that everything would remain anonymous. To make people feel comfortable, Pia and I explained that people could speak in the Vasava language and that Pia would translate back and forth. Some people spoke in Vasavi (and I spoke a few phrases and words), most people chose to speak in Gujarati, and a handful spoke in Hindi.

While I chose to be fully transparent with the people during our discussions, I would start by explaining my research first in Bt cotton farming and how people managed the expenditures with that. Once the topic of loans and borrowing was covered generally, I would explain my interest in the question of credit more elaborately. This would usually lead to a reiteration of things that they had previously mentioned, but also a sketch of what they have witnessed in the village more largely vis-à-vis credit. A rough list of indicative questions is attached in the appendix. In total, I had substantial conversations with roughly 30 farmers (in addition to farmers I spoke to in everyday encounters), and 8 lenders (ranging from banks to storeowners).

Openly talking about the concept of credit and cotton (and farming other crops) led to much deeper insights than I could have anticipated. Conversations would usually end with what they thought I should do next, whom I should speak to, and general discussions about what kind of foods to try in the region, what the jewellery was like, how to say certain words in their local language. Observations included those at important sites – at the jeweller’s, stores, banks, and tea stalls, but also during everyday conversations and while travelling from

one home to the next by motorbike. These observations serve as critical data and thereby complement the verbal conversations had with farmers.

Since the conversations had with the farmers were of sensitive nature, I chose to not take pictures as a part of my data collection as this seemed slightly intrusive after the kind of discussions had. Very few pictures were taken during my second visit, after I had spent more time with certain households, and pictures were of a more general nature. In addition to the recorded conversations, a field journal was kept to make detailed accounts of each day (Emerson et al., 2011). This included more general interactions, observations, and questions for myself to build on in the following days.

Following an ethnographic method, there was no clear separation between the phases of data collection and analysis (Hammersley & Atkinson, 2007) since some analytical insights already came up during the collection process and were written down in the field journal. By familiarising myself with the data, I worked on conceptualising it and arranging it thematically, and then comparing it to previous academic work to situate it within a larger context.

1.4.3 Demographics

The villages are mostly occupied by Vasava people; in fact, most of the land is legally protected for possession by Scheduled Tribes (STs). This did not make this a homogenous group, however, since each village had slightly differing customs and a slightly different dialect of the language. Apart from the Vasava farmers who have been living here for several generations now, I also met with households who had resettled here in a neighbouring village because of the Sardar Sarovar dam construction roughly 1-2 generations ago. These farmers were also Vasava (although with a different language) and were resettled to this specific region as chosen by the government. Another conversation was with a weaver, since I was told that weavers are considered to be the 'low caste' within Adivasi groups and were therefore never given any land. Two of the farmers were with 'sarpanch' households, out of which one was significantly wealthier than any of the other farmers. In addition to farmers, I also met bank managers, jewellers, and store owners. These people were not Adivasi but were all belonging to higher castes, and had usually moved to *Rabesa* as the area grew.

An important note is that the word "farmer" does not imply a specific gender or generation in this region. Most members of the family contribute to the farming activities in some way or the other and are all introduced as farmers. There is no single 'head' of the household, but instead, it seemed that decisions are taken as husband and wife who divide the tasks and responsibilities amongst themselves depending on what makes the most sense for their household. All the families I met consisted of 3 generations – husband and wife, their children, and the parents of the man (since it is common for women to join the husband's house, but the opposite does also happen, according to Kumar and Lobo, 2022). Further, the word farmer is not a 'fixed' category, but instead is a fluid one. Within a household, farmers work on their own field but also may be a student, a herder, a farm labourer, etc.

1.4.4 Ethics and positionality

Ethics and positionality were thoroughly considered at all stages of this research. All ethical guidelines for qualitative research were followed: in asking for consent from the people spoken to, explaining that they may choose to stop the conversation whenever they wished and that all data would be anonymised, explaining the purpose of research in transparent ways, and in asking for permission to record audio for later transcription. Data from the audio recordings were handled with care in their storage and transcription.

In addition to ethical concerns, I put much thought into my own positionality as an upper class, upper caste, urban, educated, woman researcher. I dealt with this positionality first and foremost by being entirely transparent about it in conversations with farmers, and answering their questions about me with honesty. More importantly, I tried to actively establish a more even relationship between myself and farmers in small and everyday ways. Examples of this included: always accepting drinking water when it was offered, offering my own food and water, sitting at the same 'level' as other people (so not sitting on a chair if a farmer was sitting on the floor), helping clean up other people's lunch plates, etc. While these actions were small, they centre around historically significant taboos around caste such as not sharing water (which has still been experienced in this region when visited by government officials, for instance). Additionally, it incorporated a small element of care towards the people I spoke to, moving away from more objective and clinical relationships between 'researcher-respondent'.

Chapter 2 Tracing Histories of land in South Gujarat

Several waves of colonial, decolonial, and developmental land reforms have shaped the land ownership and social topography in Gujarat. While such reforms have affected millions of households throughout the state, certain groups bore the brunt more significantly – namely, Dalits and Adivasis (Lobo & Kumar, 2009). The question of land ownership is one which has therefore attracted considerable contention (Bhagat-Ganguly and Kumar, 2020) and cannot be overlooked when discussing agrarian issues. This chapter briefly explores the history of land ownership, different waves of displacement and (re)settlement, and resulting land and water politics. Lastly, it considers changing relations with land and farming for the Vasava people.

2.1 The development-displacement dyad

For many Adivasi peoples in Gujarat, their lives have long been intimately linked with that of the forests (Skaria, 1999). The relationship with forests goes beyond a source for nourishment, as it also shapes cultural identity and religious practices (Kumar & Lobo, 2023). Inhabiting these areas followed a system of common property resources (CPR) wherein people would collectively hunt, forage, use shifting cultivation, and herd livestock, among other activities (Lobo & Kumar, 2009). In such a system of ownership, the “individual rights over lands were embedded within communal rights” (Goswami, 1986, as cited in Chaudhari, 1992, p. 10). However, both the colonial and post-colonial state failed to recognise CPRs as legitimate ownership, thus causing the systematic displacement of Adivasis⁴.

Early instances of displacement were triggered by the Indian Forest Acts (1865 and 1878) which recognised all forest land as the property of the colonial state (Lobo & Kumar, 2009). As a result, the use of forest land by Adivasis was considered a privilege, subject to being withdrawn at any moment. Several groups were made to resettle in the peripheral regions of the forest so that they could be administered more easily. By declaring forests as *res nullius* (Chaudhari, 1992), these Acts set a precedent for state control over forested land. Additionally, the Land Acquisition Act of 1894 established another crucial notion – that of ‘eminent domain’ (Sud, 2006). By recognising the state as the absolute owner of all land resources, this granted the state the right to also acquire private land for public benefit (ibid). Together, these Acts provided the legitimisation of land acquisition by the state and consequent displacement, which formed the basis for Gujarat’s development model.

In the decades following Independence (1947), Gujarat followed a rapid development strategy with large investments for dam construction, transportation infrastructure, and the making of its strong industrial complex (Lobo & Kumar, 2009). The state’s pre-established power over land facilitated these projects since they involved vast stretches of land acquisition and displaced millions in the process (ibid). Specifically, displacement was disproportionately higher for Adivasi households (and Dalits): Adivasis comprise of 50% of those displaced in the state, of which only 25% were resettled (Lobo, 2015). The dam projects alone were responsible for the majority of this displacement, with 13 dams built within tribal-dominated areas (Patel, 2011). Land acquisition for such projects thus took advantage of the state’s ability to forcefully evict private owners off their land for the public good, with specific financial compensation. However, for the vast number of cases with CPR and not private

⁴ Histories of Adivasi displacements pre-date the limited historic context given here.

ownership, compensation and resettlement were far out of the question (Lobo & Kumar, 2009).

This development-induced displacement is one of the largest causes for involuntary resettlement in the state, thus triggering inquiry into the dichotomy of development-deprivation in Gujarat (see Breman, 2019; Shah et al., 2002; Lobo & Kumar, 2009). Such displacement has also continued in many waves over the last decades due to the number of dam projects. A few villages beyond this study's intended fieldwork area housed some recently resettled Adivasis from the Sardar Sarovar dam project (SSP). Having moved to this region in 1994 from steep forest lands which are now submerged, one of the household heads explained to me:

“the government said they would do a lot, but they only delivered half of what they promised to us. [...] Half of the people from my land still haven't been resettled; they weren't given any land. And this land now, the government can take this land away from us whenever they want. We live in fear that maybe they will take this away from us too. And then where would we go?” (N12)

Such displacement, which disproportionately affected groups living closely with the land, shaped the socio-material relations to come in this region. Not only were the displaced groups negatively affected in their loss of land, livelihood, and more, but other groups were disproportionately benefitted from the public projects. Namely, the water from the dam projects benefits farmers growing the thirsty sugarcane crop, sugar industries, agriculture of the GR, and feeds the industrial complex's needs (Lobo & Kumar, 2009). It is important to note that such displacement did not come without serious protest – from several Adivasi groups themselves, activists, and NGOs (Baviskar, 1995). Despite such efforts, dam construction was only stalled due to legal battles, but eventually went ahead (Lobo & Kumar, 2009). In the end, the land acquisition and development in the state mostly benefitted specific groups – the dominant agrarian castes (Patels, Patidars, Rajputs, among others) and big industries (Rajaram & Vasava, 2021).

2.2 'Land to the tiller' – a new wave of displacement

While the above-mentioned land reforms describe one of the larger stories of displacement, there are still others which frame land ownership today. Most relevant in understanding the history of Vasavas in *Rabesa* is displacement related to specific decolonial land reforms starting in the 1950s. Such reforms were created to transition out of the colonial *zamindari* system by removing intermediaries and instead recognising land in the name of those that tilled it – thereby birthing the slogan 'land to the tiller' for such policies (Sud, 2006). This was also to eliminate tenants and sharecroppers by providing them with land in their name (ibid). Despite efforts for four decades, such reforms were largely considered failures since the percentage of land transferred to tillers or marginalised peoples barely made up 5% of arable land pan-India (Kulkarni, 2016).

Not only were such reforms ineffective in reaching their own goals, but they further consolidated power in the hands of the existing dominant castes and classes (Kulkarni, 2016). Sud (2006) notes the landed Patidars and Anavils (farming Brahmin caste) as two castes that benefitted most in Gujarat by working around the policies. On the other hand, actual tillers of the land were often overlooked, such as in the case of the landless Dublas (scheduled tribe) who tilled the land for the Anavils (Breman, 2019). This follows the overall trend of land reforms working in favour of upper-castes but failing to address land alienation among Adivasis (also seen in other states like Kerala: Scaria, 2016).

Of concern is also that such land reforms allowed for the systematic displacement of Adivasis, whose ownership as CPR was not formally recognised, in favour of other groups

who came in and cultivated the land – thus becoming the tillers. A Vasava farmer retold the story she had heard from her grandparents:

“I was told that there are two groups, the Vasava people and the Patel people. The Patel people were consider *ujaliṭparaj*⁵, meaning upper caste. Before, there used to be only Adivasi people there, but then the Patels and Kshatriyas came who set up there. They suppressed the Adivasi people, and made the Adivasis do the work. [...] They took over Adivasi land and occupied it. In the late 1900s, there was a law, in which it said that whoever tills the land will own the land. The Adivasi land was being tilled by Patel farmers then, and after a few years of doing this, the government recognised the land as that of the Patels. In this way, the Adivasi land went to them, and this is why Adivasis have less land. This is why Adivasis moved to the forest land to find some more land to live in” (N10).

This can be traced back in the literature as well. Lobo (1994) describes the Vasava population in Rajpipla having limited benefits from the ‘land to the tiller’ policies, and instead having to work as labourers for the incoming landlords, belonging to Patel, Patidar, and Rajput groups. The Vasava people eventually “left their ancestral dwellings in search of land and moved into the inaccessible interior forests” (Pinto, 2002, p. 217), thus reaching *Rabesa*. A farmer described the process of moving into thick forest: “this land used to only be forest land before Independence, and then our ancestors moved in here and cleared some of the forest to make space for themselves” (N8).

2.3 Whose land?

For a people tied so deeply to their land, displacement is not only about resettling in a new area. Moving to new regions meant leaving behind lands where people had generational knowledge of how to hunt, herd, forage and fish, but also which had shaped identity and traditions. Umamaheshwari (2016) writes about a similar trend of Adivasi displacement from the Godavari region:

“That land, river and forests hold memories and histories of communities formed through centuries of dialogue – through human engagement with, or interventions with these, and hence hold the living memory of these engagements. Loss of any of these is a loss also of ‘history’ and once this loss is ‘inflicted’ from above, through ideas such as interlinking of rivers or land acquisition processes, such as that of the Polavaram dam, the uprooting of certain communities from democracy is permanent, in both physical and metaphorical terms” (p. 46).

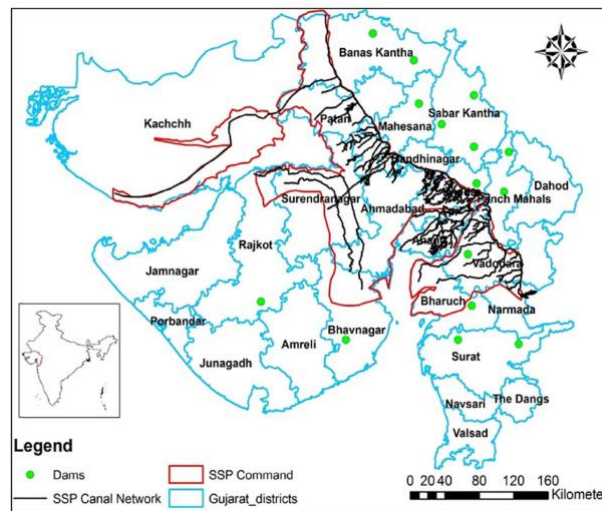
To add to this, the resulting differences among the various farmer castes and classes with respect to land and resources is not insignificant. Differences lie not only in access to irrigation water, as mentioned above, but also in the type of soil. A farmer summarised it as: “Patel land is *maati-wala* (of mud), where the crops grow better. Our land is *paathar-wala* (of rock), so crops do not grow as well” (N10). The former, mud-soiled land that is spoken about was initially inhabited by her own ancestors before being taken over by Patels.

We can therefore see the map of South Gujarat the way it is today, having been moulded by decades of colonial, decolonial, and developmental reforms. The displacement of large populations made way for several dams to be constructed, of which SSP is considered to be the lifeline of the state’s growing agricultural development (Chinnasamy et al., 2015). Figure 1 shows a map with chosen dams and the command of the SSP. Figure 2 shows the area submerged in the making of the dam. The dams, coupled with investment for industries, allowed for certain regions to grow in importance. Namely, Ankleshwar and Vadodara are

⁵ literally meaning fair skin; also mentioned by Breman (1994) and Skaria (1999).

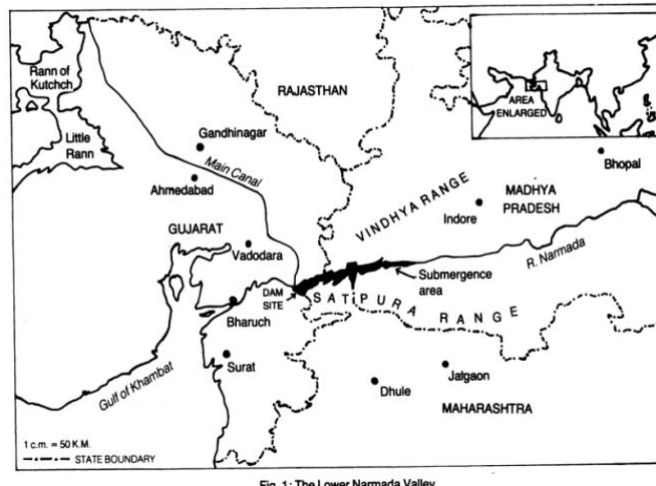
now known for their chemical, pharmaceutical and fertiliser, and Surat has become the renowned diamond-polishing hub (Lobo & Kumar, 2009). Of the people that migrated to new lands to resettle, one group is the Vasavas along the South-Eastern hills. Not everyone has the same background of settling here; there are mixed histories of people either moving due to 'land to the tiller' policies (the majority of the people I spoke to), development-based land acquisition, and some who settled down after forest protection policies came into place (KI1).

Figure 1 : Selected dam locations in Gujarat, including SSP



Source: Chinnasamy et al., 2015

Figure 2 : Submerged areas for dam construction (dated)

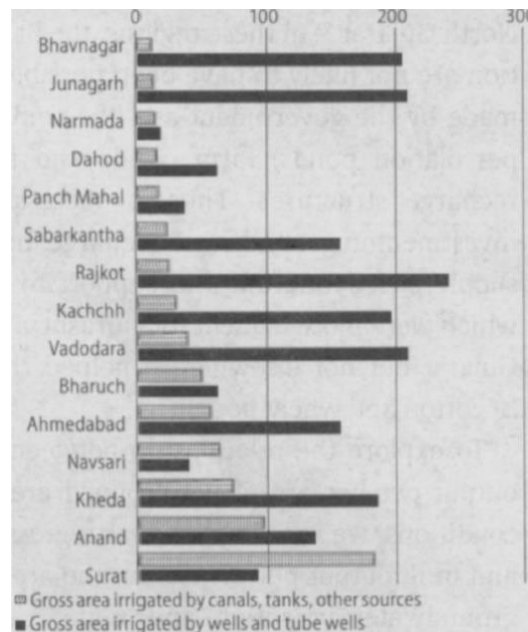


Source: Baviskar, 1995

2.4 And whose water?

Of significant interest with dam and canal placement is that it lends to the changing water politics in the state. With Gujarat's arid to semi-arid climate, a scarcity of water has always been an issue for cultivators (Hardiman, 2007). This was most often remedied by wealthier farmers with the construction of (tube)wells which could tap into water reservoirs, as encouraged by the British colonial state (ibid). What the dam projects contributed is an added layer of water politics. Specifically, while dams were constructed by submerging disproportionate amounts of Adivasi-populated land, the water from these canals often benefits them the least (Shah et al., 2009). As mentioned by a Vasava farmer, "the water from these dams goes to Saurashtra, up until Kachchh, where they grow irrigated crops. But the people of Narmada *jilla* (district) don't get water" (N8). Dam channels indeed reach up until these northern districts mentioned, but the majority of this water benefits farmers in the plains of Central and South Gujarat (Shah et al., 2009). This is visible in Figure 3 which shows district-level variations in use of both canal and groundwater irrigation.

Figure 3 Sources of irrigation per district



Source: Shah et al., 2009

What is evident here is that Narmada district, the district within which the study area falls and one which is largely Adivasi-populated, has the smallest amount of irrigation from both sources. Among farmers with larger access to irrigation, there is also a difference in water sources. Northern districts such as Kachchh are more reliant on groundwater, and Southern districts like Surat have proportionately more access to canal irrigation (Shah et al., 2009). With the increased command of dams in the last decade, reliance on the latter is expected to be higher now (Chinnasamy et al., 2015). Nevertheless, the majority of cultivators in *Rabesa* do not have much access to irrigation and rely majorly on the southwest monsoon, which is increasingly erratic (ibid). The consequences of such water politics are considered later in chapter 4, but it is evident at this point that access to water is uneven across class and caste groups.

The politics of (tube)well construction initially, followed by the constructed command area of dams have largely shaped Gujarat's 'waterscapes' (Baviskar, 2007). Waterscapes, as an analytic concept, goes beyond the material differences in water access to also examine the sociocultural differences it creates. Within Gujarat's context of water scarcity, the political economy of water is born out of class and caste relations but also continually shapes the winners and losers of various technological innovations (Dubash, 2007; Shah et al., 2009). Farmers with access to either groundwater resources or canal irrigation enjoy higher productivity and profit margins (Chinnasamy et al., 2015), and these farmers have long belonged to higher classes and castes (Dubash, 2007). Moreover, it is not only the difference in agrarian classes, but that water from dams are prioritised for industries and urban use before they are then channelled to these farmers (KI1). Together, such prioritisations are visible in the making of Gujarat's waterscapes, which significantly determines advantages in production, both agrarian and industrial.

2.5 Changing relationship with land among the Vasavas

It is this context of land and water politics which has shaped the way Vasavas now live in *Rabesa*, South Gujarat. The Vasavas in *Rabesa* have not always been a farming population, at least not in the way that farming is understood today. Around 50-70 years ago, the people often lived off the land with a mix of foraging, hunting, and farming (KI1). Describing how people used to live a few generations before, a Vasava farmer said, "they would go to the jungle with their cows and then forage for foods and have it with milk, yoghurt, and the like" (N1). Cultivating land started becoming more common in these last few generations, but as one elder Vasava farmer recalled his grandparents' generation, "before people did farm, but it was not like this. They would just throw some seeds around. They would not sow anything in the way we do now" (N22). Living off the land thus comprised of a mixture of foraging, sowing seeds, fishing, hunting, and dairy from the cows.

The kind of farming that initially took place was entirely subsistence-oriented and with a variety of indigenous crops, according to KI2. Importantly, this style of farming was also completely 'circular' since everything from the land would go back into the land and not much else was required. Some elders recalled their experiences of farming when they were young, describing that "the seeds were from the house, the labour was from the house, the manure was from the house" (N4), because of which they had no farming expenditures. Eventually, *desi* (traditional variety) cotton started being grown as a cash crop in small amounts to keep up with occasional living expenditures, but this also followed the circular way of farming (KI1).

Growing the cotton crop has changed the landscape of farming in the last few decades with the introduction of newer technologies. According to KI1, *desi* cotton has virtually disappeared since 1996 to make way for improved seed varieties introduced by the Krishi Vigyan Kendra (KVK). The KVK is an extension of state agricultural universities and works to disseminate agricultural technology directly to farmers (*About KVK*, n.d.). Initially, they introduced hybrid cotton seeds named *shankar* (hybrid)-4, *shankar*-6, and so on (N6). Later, once genetically modified seeds were cleared for use, the KVK also encouraged the adoption of Bt cotton and are therefore considered one of the main ways in which Bt cotton reached Adivasi regions (KI1). This introduction to Bt seeds was considered a way for NGOs to increase income among tribal farmers, and Bt cotton eventually took off in this region around 2011. Most farmers spoken to for the study started growing Bt cotton around this time, thus starting with it 10-12 years ago, while a handful only started 5-7 years ago.

While growing *desi* cotton followed a circular farming logic, the sowing of Bt cotton meant the introduction of an entirely new model of agriculture. The *desi* variety would grow

very tall and require minimal spending: “*desi* cotton did not have much expenditure, not even pesticides. There were no pests on the crop. The only things to manage were the weeds, which people would cut off manually” (N4). But things are quite different today with Bt cotton, which is input-intensive but also produces a lot more crop. The case now is that everything needs to be bought: “there is something for everything – for the seed to stick, to kill the weeds, to improve the soil, for everything” (N8).

Essential inputs and expenditures to grow cotton therefore include seeds (which need to be bought every year since they do not multiply), pesticide, fertiliser, urea, herbicide, insecticide, hiring tractors, and paying labourers for sowing, weeding, and harvesting. It is not only that several inputs are needed, but that the required inputs are increasing annually: “we used to only put a little fertiliser and pesticide, but now the soil has gotten used to them, so it asks for more... the land is like this, nothing grows without fertiliser” (N6). This matches accounts by previous research which describe the ‘insecticide treadmill’ that seems inherent to Bt cotton production (Kranthi & Stone, 2020). These authors highlight consequences of this type of input-intensive agriculture, stating: “[t]he rising input dependence of Indian cotton farming [...] has pushed farmers into an increasingly capital-intensive production regime, even as they continue to face considerable risk from year-to-year agroecological and market vagaries” (ibid., p. 195). This paper points out crucial factors: the shift to capitalist production, the threat of climate and pest attacks, record-high pesticide use (figure 4), and the sharp declining outputs from Bt cotton in Gujarat (figure 5).

Figure 5 : Expenditure on insecticides for cotton production in India

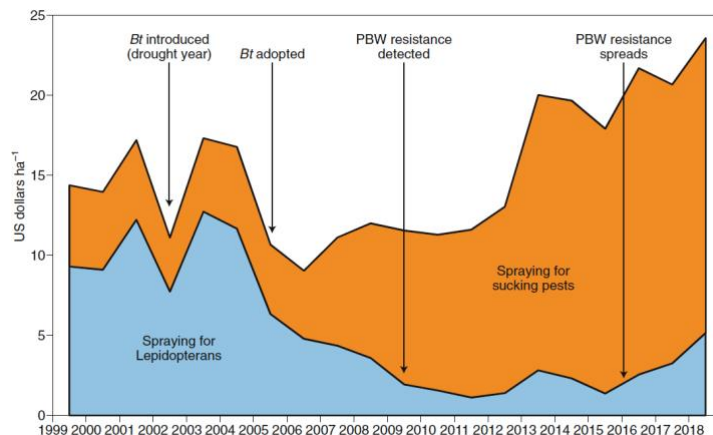
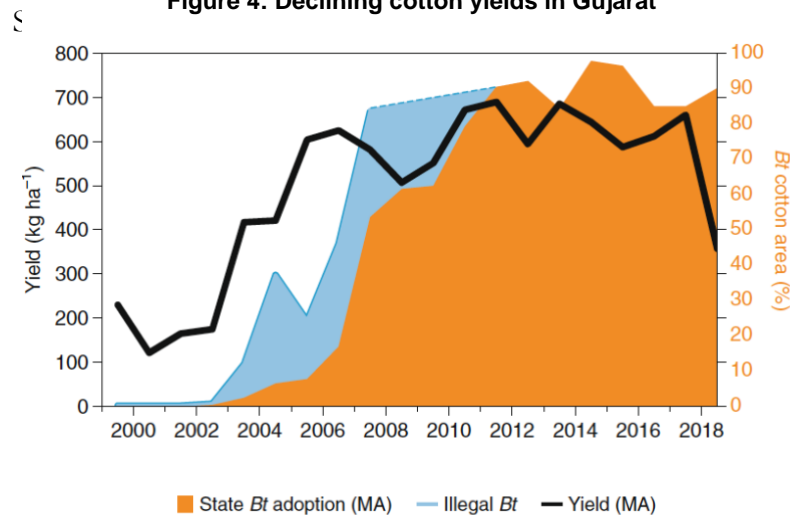


Figure 4: Declining cotton yields in Gujarat



Source: Kranthi and Stone, 2020

These figures indicate large consequences for farmers. Further, the fact that myriad products are especially engineered and sold for the output of the Bt cotton seed illustrates that farming interests do not lie with farmers alone but also with several agro-industries which develop these technologies (Najork et al., 2022). Thus, the shift to capitalist agriculture needs to be explored further to understand its consequences.

Chapter 3 Agrarian Capitalism and Everyday Credit

Despite residing in the remote hilly forests of South Gujarat, the transition from subsistence farming to the adoption of new agricultural practices ties the Vasava farmers to a larger, global agrarian system – one which functions with its own logics, players, and rules. These complex actors and rules are not directly visible within the villages, but nevertheless shape the everyday farming practices. This chapter explores the industrial capitalist model of farming, the resulting frequency and sources of credit, and how labour migration fits into the equation. In exploring these areas, it covers the changing dynamics in this region.

3.1 An industrial capitalist model

The shift to an industrial capitalist model of agriculture is not new; it is recognisable in many contexts. Fitzgerald (2003) delves into this transition phase of the 1920s in the United States and describes the emergence of an industrial logic in agriculture. Such a logic replaces the need for traditional understandings of plants and soils with standardised, mechanised, and ‘efficient’ models of production – thus described as ‘every farm a factory’ (ibid). While Fitzgerald’s accounts include large American farms which can be run as factories, the case in Indian cotton farming comprises of predominantly small and marginal farmers (Sethi, 2021).

Nevertheless, the logic of industrialist capitalist farming is apparent in Bt cotton production in India since genetically modified seeds are engineered as such (Sethi, 2021). Firstly, the seeds are engineered to not reproduce enough viable seed in the next generation, making it difficult to continue with seed saving. Secondly, there are a plethora of products designed and marketed to combat several agricultural problems – often problems which arise from Bt cotton production itself (such as increased use of urea after nitrogen depletion). And lastly, the patented seed technology inherently allows for capitalist accumulation since each seed-packet purchase contributes to the agro-companies engineering the seeds (ibid). Such aspects of Bt cotton make it virtually inseparable from an industrial capitalist model.

The transition to this industrial capitalist model of agriculture was apparent in virtually every conversation with farmers in *Rabesa*. There was an overall erosion of traditional ways of farming with seed-saving (for cotton), weeds being used as animal fodder, prioritising soil health, more circular ways of farming, etc. Instead, farmers now rely on a mix of products to ensure high yields, such as with several rounds of herbicide to kill off any weeds that may divert nutrients from the cotton crop, and strive to increase output each year (Figure 6). A young farmer, when asked what research he deemed most necessary for farmers, explained that he only wants a solution to keep the weeds dead once and for all (N20). Moreover, farming now includes hired labour, machines such as tractors (when affordable for a household), pursuing economies of scale, and a reliance on technological innovations. All of these factors resemble an industrial farming model (Flachs, 2020) with a strong dependence created for capitalist markets (Sethi, 2021).

Growing Bt cotton has now become the norm in the villages in *Rabesa* and is especially important as a source of cash in an increasingly monetary society. A farmer summarised this: “cotton is needed to earn some money. Everyone will grow at least a little. Now it has become standard in our villages” (N22). The various expenses include things like education, healthcare, weddings, but also the cotton production itself which starts with purchasing inputs and hiring labour. The increased need for money in both production and social reproduction is associated with a rise in two activities – credit/debt and migration.

Figure 6: (Left) Commonly used insecticide; (Right) Bt cotton crop, among other plants



Source: Author

3.2 The cycle of Bt cotton and credit

The fact that Bt cotton production starts with an initial investment each year creates an inherent need for credit. This credit plays the role of bridging the financial unevenness between a farming cycle which runs roughly from July to November, or as the farmers express it: from monsoon to Diwali. Conversations with farmers suggest that farming is sometimes synonymous with accruing debt. As one farmer put it, “without debt, there is no farming... Everything happens on loans and without loans it is just not possible” (N1). Sethi (2021) describes such farming as ‘cash cropping without cash’ (p. 1405), thus leading to several sources of formal and informal borrowing that are now integrated into the everyday life of cultivators.

The regularity of credit is evident when walking around *Rahesa’s* central town itself, since it houses the various sites where borrowing activities take place such as in agro-stores, banks, jewellery stores, etc. Walking through this area, it is not difficult to see people in their borrowing activities – farmers leaving off their jewellery at the jeweller’s and at the gold loan banks, queuing in front of the bank, and signing their name on receipts at the store to promise payment after harvest. While pawning off jewellery is traditionally the most common way of borrowing, an increase in bank loans and even specialised gold loans have become increasingly important in the last two decades. In the last decade, a way of saving and borrowing from cooperatives has also arisen, and many farmers prefer this over going to the banks. A list of credit sources, their interest rates, and farmer’s use or thoughts on them are include in Table 3.1. Together, these sites have created a more ‘financialised landscape’ in *Rahesa*, i.e., both physically and socially available finance options (Green, 2022b).

Table 1: Credit sources accessed in Rahesa

Table 1: Credit sources accessed in Rahesa					
Lending source	Type of credit	Criteria, applicable	if	Interest rate	Respondents’ views

Agro-store	Credit options on purchasing inputs	Only offered at select stores and only to farmers that are well-recognised by the storeowner	~ 20% (seeds worth Rs. 1000 are purchased at Rs. 1200)	Farmer: “We get seeds and inputs on loan from the store and we pay them back with interest once the cotton grows” (N5). Store-owner: selling on credit is possible because the agro-companies themselves sell him products on credit (N17).
Bank	<ol style="list-style-type: none"> 1. Crop loans 2. Animal husbandry loans 3. Self-help group women’s loans 4. Farmer Credit Card 5. Other: Joint-Liability Group loans, Term loans (eg: for cars), Education loans, etc. 	<ol style="list-style-type: none"> 1. Loan given in name of landholder 2. Loan based on number and type of livestock 3. Minimum group of 10 women farmers 4. Must have credit history 	<ol style="list-style-type: none"> 1. 0% for first year; 4% if exceeds term (actual interest rate of 7% p.a. is currently covered by government) 2. 7% p.a. 3. 7% p.a. 4. 7% p.a. 5. [varies] 	Farmer: “A few years ago I took a loan of Rs. 40,000 and paid it back weekly over time. Then they offered me Rs. 1,50,000, which I have also paid back. [...] Now I even use a credit card.” (N3) Bank-manager: “Only the educated farmers pay back on time. Around 80% of farmer loans go into penalty because they are late [...] and around 10% cannot pay back after 18 months” (N14)
Jeweller	Credit on pawning off jewellery	Silver or gold jewellery; interest must be paid regularly or will be melted down	Depends on store. Usually 1-3% p.m.	Farmer: “My husband used to take the jewellery and leave it at the jeweller’s. Sometimes we would also lose some jewellery. I feel bad that I had to lose this jewellery, but we had no other choice.” (N22) Jeweller: “These days people come more for loans because they are sending their children to study, or they need to buy inputs during the monsoon season. [...] Around 20-25% of things aren’t taken back, so then we wait 5 years, and then we can melt it” (N15)
Gold Loan Banks	Credit on pawning off gold jewellery	Must show valid identity and proof of owning	1-3% p.m., depending on gold amount and duration of loan	Manager: “Here, we don’t have any issues with credit scores. This is why people prefer gold loans,

		jewellery (to avoid stolen items); no credit scores required; if interest unpaid, jewellery is auctioned off		because there are no documents required. With gold, we can create a loan in 5 minutes. [...] Most people get their jewellery back eventually, but 10% lose it and it goes to auction” (N16)
District Cooperative Bank for Farmers	Loan given through the cooperative which is granted by the state district bank in the region	Must show landholding documents; must be a part of a farmer’s cooperative group which saves money monthly	0% - 2% (subsidised by government; otherwise it would be 6-7%)	Farmer: “Many farmers from the village form a cooperative together and save together, and the people who need loans can take it at 1-2% percent. There are around 50 people in my group. I know some people in it but not everyone” (N6) Manager: “Now the farming is being developed. This is a hilly terrain. It used to be forest, and it has been cut down into farm land. Now to put in irrigation, make a well, buy machinery, farmers of course need loans. If they grow cotton and sugarcane, then they are trying to develop their farming and so they need the finance” (N13)
Women Farmers’ Cooperative	Loan given from the joint cooperative savings	Must save a minimum of Rs. 100 every month; maximum loan of Rs. 50,000	1% p.m.; increases if not repaid on time	Manager: “There are roughly 3,500 women who are a part of this, saving every month. [...] The interest rate is low, but people do not pay back for long so it adds up. [...] at least 25% do not pay, and then we have to keep calling them and asking them to pay it back” (N21)
Private moneylenders	Informal loan	Given exclusively to women	Unknown but steep interest rates; estimated to be around 25%	Information from bank manager; confirmed by other respondents who have heard of this happening in the past but not in recent years. Bank manager: “they only give loans to ladies

				because with ladies, the loan repayment intensity is much better. We have seen this even in banks all over India, and this is the strategy that they (moneylenders) employ. [...] they do not discuss the rate of interest. They only specify how much to repay each month. They wont specify how many months or how much interest.” (N14)
Car sellers	EMI (equated monthly instalments) for the purchase of cars (but is also applicable elsewhere to buy television sets, tractors, mobile phones, etc).	Varies depending on store and product	Varies and depends on store, car model, term of loan, etc.	Farmer-contractor: “We took a second-hand car on loan. There’s 37 weeks to pay it off. The loan was for 3 lakhs. We had to show some documents. It’s a bit risky, because if you don’t pay the interest for a few weeks, then you lose the car but also down payment” (N23)

The current way of farming combined with the ample availability of credit has resulted in debt being a common occurrence in *Rahesa*. All but one households spoken to mentioned having some form of debt or another, and sometimes a few different types at once. This is most often attributed to farming-related purchases and for children’s education. However, the line between debts for production and those for social reproduction is blurry, since most households balance their debts and expenditures in several ways (Green & Estes, 2019). Most importantly, this table illustrates the everyday-ness of credit based on its regularity, and the number of actors which are involved in providing credit. Zooming out further would reveal that many more financial actors are a part of the game (Clapp et al., 2016), with many influencing the market price for cotton (Clapp & Isakson, 2018), but this remains out of the scope of analysis here.

3.3 The consequences of credit/debt

Being in debt, from whichever source, comes with the burden of paying it back. Households thus adapt their way of farming to repay their loans. The most common farming strategy employed was growing *more* cotton and high-grade rice so that they could be sold. A farmer who has been taking loans rather regularly from the bank explained that he paid them off by “growing more cotton, and also rice; when there is higher-grade rice, we get more money from it” (N4). There was often a balance sought after in the mix of crops grown: families would grow the bare minimum amount of subsistence food crops required (millets, *desi* rice, split pea) to feed the family during the year, so that the rest of the field can be sown with cotton. Growing enough cotton to pay back debts is a significant source of worry for most farmers, especially during untimely rains which threaten yields. Farmers thus employ various strategies to increase farm productivity. Some reported an increased use of herbicide and

pesticide so that their crop outputs increase enough to pay back their loans. One farmer commented on her use of both products: “the soil gets destroyed, this of course we know, but what else can we do? How else would we pay back our loans? Labour is too expensive” (N1).

The dynamics presented in this quote resemble those that have been observed in Burkina Faso, to give just one example. Apart from the economic pressures of debt, the changing sociocultural context of children going to school and labour becoming more expensive leads farmers to choose labour-saving inputs such as herbicides, and thus going further into debt (Luna, 2020). The author argues that the technological treadmill is driven by both economic and cultural factors (ibid.), which is comparable for the case of *Rabesa*: it is not debt alone, but debt embedded in its context of wage labour⁶ that keeps the treadmill going. Further, knowledge of the ecological consequences is not enough to limit pesticide use since the economic and cultural contexts confine the choices of farmers. This is especially true when an entire area adopts a new production method as it makes it harder for a single household to not follow the technological treadmill (Sethi, 2021).

Embedded in a larger context of cultural and agrarian change, a relationship is still apparent between Bt cotton and credit. Not only is credit necessary for the initial investment in Bt cotton each harvest season, but using credit also pushes farmers towards growing more Bt cotton and growing it in more intensive ways. Thus although socio-cultural contexts facilitated a smoother transition, Bt cotton uptake would not have happened as readily and systematically without credit. In addition to actively influencing production, debt also shapes the environmental and socio-cultural contexts; it is tied to choices which have ecological consequences on the soil and water, social consequences on the way community ties are built, cultural understandings of land use, and psychological consequences on the cultivator-debtor until repayment – highlighting the various consequences of indebtedness (Gerber, 2014).

Households partake in a number of activities to pay off debts in time. Apart from adapting their farming ways, they also rely on selling milk from their cattle, selling cows and goats, working as farm labour in the villages, migrating to find work as farm or factory labour, and aiming to get government jobs as nurses, teachers, police, etc. when possible. All of these activities provide more reliable incomes than farming itself does, and therefore is crucial to continue farming.

3.4 Labour migration

Two simultaneous processes increased the need to migrate as labour: the increasing need for cash (for production, social reproduction, and debt repayments), and the considerable replacement of labour in villages by certain inputs as discussed previously. Many households stressed the need to have some sort of income to be able to stay afloat, and the economic prosperity of a family usually depended on whether they had an income-bringer and what kind of job this was. Diamond polishing and government jobs bring the highest incomes, remedying most stresses that come with farming. Other forms of income, such as working as farm labour or factory labour, bring in less money but nevertheless play a substantial role in keeping farming going. This is not only to pay for the necessary yearly inputs, but also to pay off debts.

The cruciality of labour migration in staying afloat is illustrated by the case of a household which did not rely on any form of credit for farming because of their daughter’s income: “we don’t have to worry too much because our eldest daughter works in service as

⁶ Previously, labour used to be exchanged between households in communitarian ways, but the increased need for cash has made labour a service available at a price.

an assistant inspector and she helps out with the expenses” (N2). When asked how they managed before this, they explained that the husband used to go to Surat to polish diamonds, and so they had enough income even then. This was often the situation that most families strived towards, because of which they took out education loans for their children. The households which did not yet have the option to work such high-paying jobs often worked as farm or factory labour.

Labour migration is considered necessary by many to continue Bt cotton farming and also to pay off debts accrued in doing so. As a farmer mentioned, “to pay for all of this, we borrow and then pay it off by working as labourers” (N5). She later explained that they migrate to other regions to work for wealthier Patel and Patidar farmers who need more labour. These farmers also have irrigated farms, and therefore require labourers all-year round (instead of in specific moments like in the villages where they live). The locations mentioned most often as sites of labouring were those which rose to importance during state development in the past few decades: Rajpipla, Ankleshwar, Vadodara and Surat.

3.5 Changing dynamics

Exploring the various aspects required to continue production and social reproduction in these households, it is evident that Bt cotton production is not made possible only by the technological innovation in itself. Like Fitzgerald’s (2003) analysis of American industrial agriculture in the 1920’s, the shift in agricultural practices is created and sustained by a web of technical, social, and ideological relationships. It is therefore not only the creation of agricultural products, but the presence of (and dependence on) capitalist markets, accessible credit infrastructure, changing household dynamics, labour opportunities etc. (ibid.) that has sustained Bt cotton production around *Rabesa*.

What is also evident is that, by adopting this new agricultural model, farmers in *Rabesa* are inserted into state-, national-, and global-dynamics. Growing patented seeds, they are directly tied to capital accumulation for large agro-industries, but doing so requires them to also be integrated into a financial system as disciplined debtors and industrial subjects. Bt cotton production is thus not sustained in a vacuum, but requires a whole web of new agrarian and financial relations.

Locating credit in this web of relations is not difficult as the technological treadmill is followed by ‘indebtedness treadmills’ (Karamchedu, 2023). Since farmers in *Rabesa* have adopted Bt cotton more recently and in lesser proportions than other studied areas, households do not appear to be in downward debt spirals but are instead constantly chasing the next debt repayment. What separates the latter from becoming the former may only be one too many shocks, indicating the precarious position of farmers (Flachs, 2019). Understanding what it required to push this situation into one of downward debt spirals thus requires an understanding of risk within this farming method and how it is distributed within the current web of relations.

Chapter 4 The role of credit/debt

The previous two chapters cover a brief historic context of South Gujarat and the changing agrarian (and financial) dynamics within the Vasava farmers in *Rahesa*. This chapter now zooms into credit/debt relations, and more specifically, analyses the role of debt in agrarian change. This is done by first analysing the burden of debt within a household, then at the level of *Rahesa*, and lastly at the level of the (southern region of the) state. In doing so, it covers the burden of debt and its role vis-à-vis gender, class, and caste, respectively. Additionally, I consider the broader implications of debt within vulnerable climate contexts and analyse the role of debt in the making of agrarian crises.

4.1 Within the household – debt and gender

Before delving into differences among households along the lines of class and caste, a difference in debt use is already visible within the unit of the household – namely, by gender. This did not come up in conversations with the farmers themselves, but it became clear from the lenders' perspectives that there is such a thing as women being the 'better debtors'. This is most stark when considering private moneylenders within *Rahesa* who solely lend to women because of their supposed better repayment discipline. However, the pressure on women should not be chalked up to this group's actions alone. What also needs examining is the push for formal credit to women, especially through loans for self-help groups (SHGs) which comprise of 10 or more women. Since SHG loans provide the least risk to banks, they are also encouraged the most at the moment. A bank manager explained this in detail:

“And this is something we've seen all over India in our banks – with ladies, the loan repayment intensity is much better [...] Women pay back most intensely and regularly. You will notice that SHGs have the lowest NPA (non-performing assets). They (women) are the safest. And especially SHGs. It is the lowest risk. Suppose out of 10 women if 1 has an issue with repayment, then the other nine will help out with the tenth one.” (N14)

Two things are evident from this case. Firstly, there is a certain moralisation of women (Cavallero & Gago, 2021) which makes them 'better debtors' in the eyes of lenders. The relationship between gender and repayment has been observed in many contexts which find women to be better at repaying (D'espallier et al., 2018; Engel & Pederson, 2019; Rahman, 1999), thus bringing to light that debt not only disciplines but is also targeted to the already disciplined. Secondly, the fact that women are better debt subjects has been institutionalised in financial systems. This is also visible in microfinance operations which deliberately cater to more women (D'espallier et al., 2018). Highlighting this gendered difference problematises the notion of financial inclusion of women and instead considers the appropriation of women's labour (Cavallero & Gago, 2021). Seen through this lens, the gendered difference in debt has implications on where appropriation of household value comes from and additionally, how risk is distributed within the household.

4.2 Within *Rahesa* – debt and class

The role of debt in shaping agrarian class relations has been theorised by many scholars (see Gerber, 2014), but identifying class position itself is easier done in theory than it is in empirical situations (Bernstein, 1977). This is also true for the Vasava farmer population in *Rahesa* since most households share similar class backgrounds (KI1), and the differences in

economic position is often based on how much income family-members can bring in from outside. However, a distinction can be made among the landed farmers based on a few characteristics.

Out of the study sample, I identify only two households as ‘emerging capitalist farmers’ (Bernstein, 2010) based on the fact that they do not need to work as farm labour for other farmers, and that they engage in ‘expanded reproduction’, i.e., they can accumulate capital to some degree in most years and reinvest it in (re)production for the future (ibid). This is made possible by their relatively larger landholding and higher external income. Moreover, this is the only group which was satisfied with Bt cotton production and saw it as a ‘worthy investment’: “you get back double the money you put in”, as one farmer said (N2). These relatively wealthier farmers hire large amounts of labour, use more inputs, and cultivate a much higher proportion of cash crops (cotton, higher-grade rice, and until recently⁷, sugarcane). However, such households are quite rare and there are only a couple of large farmers per village, according to Pia.

All remaining landed farmers share similar characteristics. Firstly, they occupy shifting positions of being landholding farmers while also being farm labour for neighbouring households. Secondly, they only produce enough for ‘simple reproduction’, i.e., they strive towards meeting their consumption needs (Bernstein, 2010). Growing Bt cotton is relatively harder for these families, especially due to the high amounts of investment needed each sowing season. Such families rely on their own household labour as much as possible and try using as many inputs as they could afford. What separates these households in their ability to meet social reproduction needs is often the kind of income family-members can bring in. Those who can secure more earnings are more easily able to meet consumption needs, and those who can only migrate as farm or factory labour are constantly trying to make ends meet. While it is possible to consider the former group as ‘middle farmers’ and the latter as ‘poor farmers’ or small farmers⁸ (Bernstein, 2010), what separates the two groups is a fine line and often one which can fluctuate in short periods.

The difference in experiences with Bt cotton production highlights an important point: that Bt technologies are not as ‘scale neutral’ or ‘resource neutral’ as they claim to be; larger and wealthier farmers still perform considerably better with such technologies (Gray & Dowd-Uribe, 2013; Najork et al., 2022; Sethi, 2018; Shah, 2005). This, and the overall ability to meet consumption necessities, shapes how different classes of farmers interact with debt and, in turn, risk (Ramprasad, 2018). In the study sample, larger farmers turn to credit less frequently and use it for larger amounts such as buying tractors or financing university education. Conversely, the remaining majority of farmers rely on credit frequently and for everyday activities of production and reproduction, to the point where it is difficult to differentiate between the two (Green, 2022b). This often means relying on multiple sources of credit at once and constantly chasing the repayment of debts from monsoon to Diwali, resulting in an ‘indebtedness treadmill’ (Karamchedu, 2023).

While there is no large-scale downward debt spiral, smaller farmers often need to carry forward debts until the following year if there are bad harvests or other shocks. In situations like this, farmers continue paying interest for many months, increase the number of credit sources borrowed from, and may turn to ‘loan recycling’ (Rahman, 1999) wherein they

⁷ Sugarcane cultivation was largely discontinued recently because forest animals would come and destroy the crop, according to N11.

⁸ The classification here purposefully differs from landholding-dependent categories (which also refer to terms like small, medium and large farmers). As mentioned in the methodology, size of landholding was often a misleading and arbitrary indicator of a household’s class position due to a number of other factors like size of family, number of dependents, and amount of external income. The use of categorization in this chapter therefore refers to such based on agrarian class theory.

borrow from one source to pay off another. This has two significant consequences in shaping class-based asymmetries. Firstly, smaller farmers often pay higher amounts in interest to their lenders. Since interest accrued can be seen as an exploitation of surplus value created (Roseberry, 1978), this signifies an increased appropriation of value created by small- and medium- farmers. Secondly, the frequency of credit and variety of sources considerably increases the level of risk taken on by these farmers and thereby makes them more vulnerable to shocks and (un)foreseen expenditures (Ramprasad, 2018). Being in a more vulnerable position than their wealthier counterparts is of much significance when operating with the uncertainty of Bt seeds (Shah, 2005), the implications of which are discussed in the following sections.

4.3 Within Gujarat – debt and caste

This class analysis also carries forward when comparing the smaller farmers in *Rabesa* to farmers of the dominant agrarian castes in Gujarat, who are often larger and resource-rich farmers (Shah, 2010). The latter groups enjoy higher returns from Bt cotton which are only possible with access to more resources, land, labour, and water. Further, because these groups of farmers adopted Bt cotton during its introduction (legally and illegally), they were likely to experience higher returns from their ‘early adoption position’ which granted them higher initial profit margins (Levins & Cochrane, 1996). Since land and water distribution has been historically asymmetrical between the Vasavas and the Patels and Patidars (as discussed in chapter 2), the difference in success with Bt cotton is not only a matter of class but also one of caste.

Additionally, the indebtedness of Vasava farmers plays an important role in their out-migration as farm labour for such Patel and Patidar farmers. Replicating the historic labour relations between the two groups from the ‘land to the tiller’ policy period (Lobo, 1994), some Vasava migrate to the same region where their ancestors once resided. While it is too deterministic to say that it is only debt which causes the reinforcement of this caste relation, its role here cannot be overlooked. The decision to grow Bt cotton for smaller farmers is one which cannot be separated from credit, and the two together necessitate external sources of income. With the pressure of debt repayment, those with limited income options must work as wage labour for higher caste farmers.

In the past, the relationship between debt and caste was obvious and crucial in maintaining agrarian relations, as is illustrated by Breman’s (1994) and Brass’ (1999) work. Breman’s (1994) work in South Gujarat explores the labour relationship born between landless Dublas (Adivasi) and landholding Anavil Brahmans (peasant Brahmans, upper caste), where the former entered a debt bondage relation to the latter. Although this system of indentured labour ended a few decades before Breman’s own fieldwork in the 1960’s, he still notes the residuals of this system. Since the Dublas were still in constant cycles of debt to meet consumption needs, they worked as casual and daily wage labour for the Anavil Brahmans. Over time, the relationship transformed from one of bondage secured by debt to that of ‘voluntary’ labouring jobs because of debt (ibid). Thus, debt became less directly coercive but still remained a crucial factor in maintaining the agrarian relations.

Analysing the use of debt bondage in Indian agrarian contexts more broadly, Brass (1986, 1999) theorises that caste acts as an extra-economic form of coercion in addition to the debt relation itself. As Brass’ work focuses on unfree labour relationships, it sheds light on caste and debt being conjoined factors which can sustain asymmetrical labour-landed farmer relations. In *Rabesa*, households are ‘free’ to choose their labour relations, but for those that are the poorest of farmers, their limited options bring them back to certain caste relations. Thus, not only does caste determine land and water access, but also the labour

relations one can fall back on to pay off debts. This is at least true for the smallest landholding farmers, since farmers who are slightly more educated or have better social networks can get jobs as factory labour or diamond polishing.

It is important to note here that while debt may reinforce these caste relations for households, it also provides at least the slight possibility to remove one's children from it. This is due to the number of education loans taken by small Vasava farmers to educate their children with the hopes that they can get better paying and non-agrarian jobs. Here lies the two sides of the credit/debt coin: the fact that one can enter labour relations with upper-caste farmers to pay off debts for the prospect of their children not needing to do so. This is often a tricky battle in itself, since agrarian credit too often ends in cycles of indebtedness (especially for smaller farmers), but the previous fact illustrates two points. Firstly, it highlights why farmers choose to enter debt relations in the first place and the powerful potential of credit (Gerber, 2014). Secondly, and relatedly, it shows the duality of credit/debt and the way in which this presents itself in rural contexts.

Overall, debt is not only co-constitutive with agrarian class relations, but caste plays an important role in how this equation plays out. With complex interactions between debt and caste/class, the debt-class-caste nexus needs further theorisation within South Asian critical agrarian studies, especially within contexts of increased financialisation and neoliberalisation.

4.4 Climate and risks

With the context of agrarian relations in South Gujarat, the Vasava farmers around *Rabesa* thus cultivate Bt cotton on fields which were once forests and with little irrigation access. For the households that have access to irrigation, it is through borewells which tap into groundwater reserves. However, this is only seen for wealthier farmers, and some middle farmers who manage to 'invest' in it through credit programs. The remaining majority of farmers rely entirely on rainfall to water their crops, and the few communitarian borewells provide enough water for household consumption through the year. Despite living near rivers and dams which provide water to the rest of the state, the majority of *Rabesa* farmers therefore practice rain-fed agriculture.

The situation of water access is important for the Bt cotton crop which requires water at critical periods within its life cycle (Chinnasamy, 2015). Moreover, these critical periods are only small windows of time, and the seed is developed to have very small margins of error to produce a successful harvest (Taylor & Bhasme, 2021). Due to this unforgiving nature with deviations in water requirements, the Bt cotton seed has been considered selectively beneficial for irrigated cultivation only (Gutierrez et al., 2015). Conversely, growing Bt cotton in rainfed areas has been highlighted as a risky endeavour, often correlated with indebtedness and farmer suicides (ibid). In fact, studies which defend the idea that Bt technology is responsible for debt and suicide specifically blame the introduction of Bt seeds into an unsuitable environment, i.e., environments with low rainfall or access to irrigation (Gruère & Sengupta, 2011).

While *Rabesa* gets more rainfall than the northern parts of Gujarat (Chinnasamy, 2015), Bt crop success is not a matter of how much rainfall it gets but about its timeliness. This is of special concern when considering climate change patterns in the last few decades (Lunagaria et al., 2015). Farmers try to sow seeds to align with the monsoons, but increasingly erratic rainfalls have made this challenging. A farmer explains why untimely rains affect the sowing of Bt cotton: "this is because the seeds are soft, so they get washed away if it rains too early" (N1). When this happens, farmers must rebuy inputs and resow seeds, thus incurring double or triple the costs: "if washed away then the seeds need to be sown a second time. Last year our cotton was sown thrice because of the rains" (N2).

The increase in expenditures is noticeable with an increase in borrowing as well. The manager at the women-farmer's cooperative, who is a farmer herself, mentioned: "if they (farmers) sow seeds and it gets washed away in the rains, they also come back for more loans" (N21). In addition to affecting sowing periods, erratic rainfalls also negatively impact harvests, as explained by a farmer: "when the cotton crop bolls are ripening, it also rains unexpectedly sometimes, and then the bolls fall down. Then we get less for the crop; the prices in the market also fall down and then we barely get any money out of it" (N9). Hence, it is not only that erratic rains lead to more borrowing, but that they hinder prospects of repayment. These experiences by the farmers illustrate the seed's vulnerability and why erratic rainfalls have such a detrimental effect on farmers' earnings.

More generally, the issue of climate vulnerability is closely linked to debt. As mentioned above, an increase in erratic and untimely rainfalls leads to higher amounts of borrowing. This is documented in several cases in India where Bt cotton production in rainfed areas is associated with increased amounts of indebtedness (Gutierrez et al., 2015). Karamchedu (2023) considers these 'indebtedness treadmills' to be born out of the technological treadmill of Bt cotton combined with high levels of climate variability. By turning to sources of credit to push forward the losses until they can be repaid, incurring debt does not mitigate this vulnerability but instead translates it into financial vulnerability (Ramprasad, 2018). While the connection between climate and debt has been pointed out by these scholars, I build on these arguments to locate the role of debt in this context.

4.5 The dual role of debt in sustaining an agrarian crisis

Two things are notable from the current type of agriculture being discussed. Firstly, farming is becoming increasingly unaffordable for small and medium farmers, making it near-impossible to meet all consumption needs solely from farming (Bernstein, 2010). This 'simple reproduction squeeze' or difficulty in reproducing the household has been attributed to one's inability to afford the means of production that are established as standard (ibid.); in this case: expensive seeds, supplementary inputs, and labour. Secondly, increasingly erratic climate patterns increase farmers' vulnerability and further pose significant concerns for their future livelihoods (BIRTHAL et al., 2014). Since credit does not dissolve vulnerability but instead allows for farmers to continue with business-as-usual, debt plays an important role in sustaining such an agrarian model since it *conceals* both of these critical concerns.

Here, I draw on work by Cavallero and Gago (2021) who explore the way in which neoliberalisation manages the everyday crisis through both public and private debts. While their work is relevant in a much broader sense, I extend their arguments into agrarian contexts to locate the role of debt in shaping and sustaining agrarian change. Their argument is succinctly captured as follows: "[d]ebt is a way of managing the crisis: nothing explodes but everything implodes. Inwards, in families, in households, in workplaces, in neighborhoods, financial obligation makes relationships become increasingly fragile and precarious due to the permanent pressure of debt" (ibid. p. 15). It is not difficult to recognise this in agrarian contexts wherein each household takes on debts in order to keep up with the neoliberalised markets, and amidst the external threats of climate vulnerability and price volatility and the internal pressures of reproduction.

The agrarian crisis fuelled by neoliberalised policies (Mishra, 2020) is thus managed by each individual household's burden of debt. In doing so, a number of smaller crises are concealed. Instead of farming becoming unaffordable due to rising costs and slim profit margins, it is concealed by taking on credit in each farming cycle. Instead of climate erraticism creating alarm or deeming Bt technologies too unpredictable, it is concealed by additional borrowing to re-sow seeds a second or a third time. With Bt seeds becoming ineffective

against evolved pests, debt also conceals the losses (Najork et al., 2022). What would be seen as crises in the countryside are now pushed under a carpet and simply seen as financial distress of individual households.

This is critical when interpreting *Rabesa's* case beside other, more extreme cases of indebtedness. Accounts of Bt cotton leading to downward debt spirals and eventually farmer suicides often capture the picture after the crisis has exploded, i.e., once extreme and 'unforeseen' climate shocks detrimentally effect farmers' livelihoods. Such is the case of farmer suicides in Maharashtra, Andhra Pradesh, and Telangana (Gutierrez et al., 2015; Karamchedu, 2023; Najork et al., 2022; Taylor, 2013). These cases are often interpreted to be consequences of unexpected climate 'shocks' (Gruère & Sengupta, 2011) or poor financial decision-making on the part of individualised actors (Lazzarato & Jordan, 2012). Here, it can be questioned whether extreme climate shocks should be considered shocks in the first place, especially when they have been preceded by years of erratic climate patterns to indicate an expected worsening. For instance, by using debt to cushion the blow of untimely rains each year, debt invisibilises the vulnerabilities already posed by Bt cotton in *Rabesa*. The build-up of an agrarian crises may therefore exist long before the point of farmer suicides, but it remains concealed with the placement of debt.

Debt thus plays a dual role in sustaining the agrarian crisis. On one hand, it conceals the smaller crises building up to and indicating the final explosion in the countryside, which comes in the form of downward debt spirals and mass farmer suicides. On the other hand, it places the brunt of this crisis on individual farming households who first borrow to keep up with unaffordable farming practices and climate threats, and then bear the responsibility when a crisis erupts. In this way, the crisis can be mostly contained in the countryside without spilling over to industrial and urban areas, which would otherwise face significant volatility in raw material and food prices, and without necessitating immediate structural changes.

Here, my argument stems from interpreting *Rabesa* as a case which is still relatively nascent compared to other extreme cases. It can be argued that this comparison is premature since it is not yet known whether *Rabesa's* situation will deteriorate this extremely or not. However, I argue that the logic of comparison here does not hinge on whether this actually happens, but that *Rabesa's* case already contains several vulnerabilities which could predictably lead it to a situation of serious indebtedness. These vulnerabilities are visible with its risk of climate shocks and pest outbreak, both of which have been recorded as tipping points in making extreme cases (Gutierrez et al., 2015; Najork et al., 2022). This illustrates the need to analyse more cases which are 'pre-crisis' to better understand the underlying causes, and specifically, the evolution of debt from early stages until points of debt spirals. The fact that *Rabesa* is similar to many other agrarian situations in India highlights that causes for crisis may not be case-specific, but are only a matter of which cases lose in the face of probability when caught within structurally vulnerable modes of production.

By locating the role of debt as such, we can re-interpret the prolonged Indian agrarian crisis and its appearance in a number of states (Dhanagare, 2016). The prevalence of farmer suicide across the country may be born out of similar cycles of an unsustainable agrarian structure that is only temporarily sustained by debt relations. Moreover, the placement of debt to sustain agrarian relations determines who exactly bears the burden and the risk of such crises. All farmers take on a level of risk when adopting Bt cotton technologies within unpredictable climate contexts (Flachs, 2019), but this risk hits harder for farmers in asymmetrical class and caste relations. Further, the brunt may be borne more disproportionately by women farmers who are moralised as better debtors (Cavallero & Gago, 2021). Hence, while the benefits of Bt cotton are held within the hands of a few (appropriation by agro-industries and lenders), the risks are dispersed in a stratified manner across class, caste, and gender relations.

Chapter 5 Conclusion

This paper sought to explore the role of credit and debt in shaping the agrarian Adivasi communities in South Gujarat. Specifically, it aimed to cover three aspects vis-à-vis debt: its relationship with agricultural practices, its interaction with class and caste, and overall, its role within the ongoing agrarian change in the region. In doing so, the goal was to understand the implications of biotechnology when adopted by farmers not belonging to the resource-rich, dominant agrarian castes. On a theoretical front, it was to build upon the role of debt within contexts of class, caste, and asymmetric power relations. The research questions were answered by first exploring a brief historic background, followed by qualitative ethnographic research consisting of observations and conversations with farmers and various lenders. The following section summarises the main findings of this paper and considers its implications, limitations, and identifications for future research.

A relationship between credit and agriculture practices is evident. To begin with, the adoption of Bt cotton is only made possible by accessing credit due to the initial investment needed to buy seeds and inputs. Further, since these inputs must be purchased every year and often in increasing amounts, farmers find themselves on ‘indebtedness treadmills’ (Karamchedu, 2023) wherein they must constantly chase the next debt repayments. By taking on more debt, farmers also try to grow more Bt cotton to be able to repay their loans – thus creating a cyclical and reinforcing relationship between Bt cotton and credit. Additionally, there is an association between debt and increased use of pesticides and herbicides (also seen elsewhere: Luna, 2020). Debt therefore allows for the adoption of Bt cotton, but also encourages an overall intensification of production (Gerber, 2014).

Next, debt is experienced differently among households based on one’s class and caste position. Among Vasava farmers, small and medium farmers more often find themselves in positions of continually chasing debt repayments. Larger farmers, even when from an Adivasi community, perform better with Bt cotton production and with the debts required. This brings into question whether such technologies truly are scale-neutral or resource-neutral (Bernstein, 2010), and findings indicate otherwise. In addition to class-based differences, there was also a difference in the way households managed debt based on their caste positions. To pay off debts, many small Vasava farmers migrated to work as farm labour for larger Patel and Patidar farmers, thus reinforcing old caste relations. This is in contrast to what larger Vasava farmers can do, who rely on income from higher paid office jobs, or what large Patel farmers can do, such as rely on remittances from relatives (Shah, 2010). This demonstrates complex interactions within the debt-class-caste nexus which requires further attention to understand the heterogenous experiences and consequences of agrarian debt.

Further, an unanticipated but previously documented finding (Cavallero & Gago, 2021; among many others) involved women being moralised as ‘better debtors’ by both informal lenders as well as formal banks. The latter reach out to women as their lowest-risk group through special self-help group (SHG) loans throughout the country. This problematises the agenda of financial inclusion for women, which is put forward by many microfinance organisations (D’espallier et al., 2018). Thus, it is not only that debt disciplines the borrower (Gerber, 2014), but that credit is strategically targeted towards the already disciplined.

Based on these differences by gender, caste, and class, there is also a difference in how risk is taken on in Bt cotton production. This is especially evident in light of erratic climate patterns damaging Bt cotton crops which need watering at specific intervals in their growth cycles (Taylor & Bhasme, 2021). Since larger farmers can afford irrigation, they can cater to the Bt seed’s fragility. However, like many Indian farmers, most Vasava farmers practice

rainfed agriculture and the increasing frequency of untimely rains causes substantial damages to crops. Due to this, growing Bt cotton signifies higher amounts of risk borne by smaller farmers. This is of special concern since the relationship between Bt cotton and farmer suicides have been attributed to climate shocks (Gutierrez et al., 2015). Additionally, projections for Bt cotton production are declining alarmingly (Kranthi & Stone, 2020). Together, these factors put to serious question whether biotechnology should be marketed as a technology for all, and if it is, then at whose expense this technological progress happens.

Lastly, the role of debt within the ongoing agrarian change can be discussed. Findings align with previous work on credit and its role in financing agrarian change (Green, 2022a) in this region, since a shift towards biotechnology and capitalist models of agriculture is only made possible by credit. Going beyond this, I build on Cavallero & Gago's (2021) work to propose that debt plays a crucial role in the concealing and sustaining of agrarian crises. Since accruing debts allows farmers to continue with production even when unaffordable and damaged by climate patterns, debt works to conceal the making of a larger agrarian crisis. These indebtedness treadmills allow farmers to continue temporarily, but when faced with a more extreme climate shock, may fall into debt spirals and result in farmer suicides (as is seen quite often: Gruère & Sengupta, 2011). Debt thus plays a dual role – of concealing the smaller crises (unaffordability and erratic climate) building up to the major agrarian crisis (debt spirals and suicides), while also placing the brunt of the crisis on individual farming households.

This dual role of debt has important implications with how the agrarian crisis is treated. Firstly, the concealment erases much of the information indicating that a crisis is in the making, which has consequences in trying to mitigate the crisis in the first place. A crisis-in-the-making can thus be kept functioning and also hidden from the public gaze. Secondly, since the brunt is borne by individual households, debt conceals the need to create structural changes. Although there are several accounts of farmer suicides across the country, the structural changes to address the crisis have been little to none. The role of debt thus cannot be overlooked in the making of the current agrarian landscape.

These findings are based off of the case of *Rabesa*, which provides crucial insights as a non-extreme case, i.e., one which is neither thriving with credit nor is it facing severe debt spirals and suicides. This is because of its relatively recent adoption of Bt cotton with the use of credit, and the fact that virtually no households have not fully switched to cash crop production. However, it is still visible that *Rabesa* can turn into a case of severe debt spirals if there are a few consecutive years of adverse climate patterns or a singular extreme season. With the current climate patterns, this does not seem to be improbable. Hence, *Rabesa* can be interpreted as a case to understand the evolution of debt before there are downward debt spirals.

Herein lies a major limitation of this study, that it is only a snapshot in the evolution of agrarian debt relations. While I have interpreted it here by comparing it to other critical cases and their conditions, longitudinal research is needed to elaborate on these findings in a more substantial way. Further, certain quantitative data on exact debts, households expenses, and even climate patterns would be important in complementing the qualitative findings. Thus, this study offers a preliminary analysis and opens up questions for future research around agrarian debt. Specifically, there are opportunities to explore the role of debt in concealing escalating climate concerns, and to understand the temporal evolution of debt from initial access to credit until periods of downward debt spirals. These areas would be of relevance in understanding and tackling the agrarian crisis India is faced with.

Appendices

Appendix A: List of Respondents

These are referred to throughout the RP based on the number. For example, N1 indicates quoting a conversation from conversation number 1 below.

1. 3 farmers (women) from 2 generations: 2 are sisters-in-law, one is the mother-in-law. They are a relatively large family with 3 brothers and their wives living together with the children. One of the brothers is a sarpanch. They farm together on a single plot of land, which is relatively big.
2. 3 farmers, from 2 generations (couple and their younger daughter). They have an elder daughter who works as an assistant inspector and before that the husband used to work as a diamond polisher in Surat. They are the only family that mentioned not taking any loans for their farming since they can cover all the expenses with their daughter's income.
3. 2 farmers from 1 generation (couple). They are relatively older, and their land has already been divided between the man and his brother, and his own land has been divided between him and his children. He now does not have too much land and therefore also grows higher-grade rice to sell in the market.
4. 2 farmers from 2 generations (mother-in-law and daughter-in-law). They used to grow traditional cotton until 2000s, then tried to grow hybrid and Bt cotton but stopped because they found it quite expensive. The farming is mostly done by the two women, and the husband earns an income doing a job in the town.
5. 4 farmers (women) from 2 generations (3 sisters-in-law & 1 related older woman). They all have kids who study and this is the bulk of their expenditure. They also attributed their decision to grow cotton to their children's expenditures. Nobody in the family has an income job, so they talked a lot about migration and labouring.
6. 3 farmers from 2 generations (couple & mother of husband). They used to grow hybrid cotton before Bt cotton. They prefer going to the farmer's cooperative to get a loan, but also go to other places when needed.
7. 3 farmers from 2 generations (couple & father of husband). They have a very small plot of land and they used to take a lot of loans until a few years ago. They used the loans to also switch to drip irrigation and horticulture production, which is much more expensive, but they now get enough returns from it, so they no longer need loans. They primarily grow cash crops and very little subsistence crops, so they rely on buying their food from the market or at ration shops.
8. 2 farmers (women) from 2 generations (daughter-in-law & mother-in-law). They do not have any income-bringers, so it is difficult for them to take loans at the bank (other than the crop loan). They go to pawn off jewellery more often instead. They try to work as labourers in the village as often as possible.
9. 1 farmer (woman). They have a very small plot of land so she can only grow a limited amount of cotton. They still try to grow some cotton so that they get some cash. She has a lot of goats so she tries to sell a few each year to cover the cost of farming at the beginning of the season. She also works as labour in the village as often as possible, but because she does not get enough work, she relies a lot on pawning off jewellery and has lost a lot of her jewellery to debts that could not be repaid

10. previous 3 farmers & translator: conversation about caste. The conversation came up naturally while discussing the dam projects and where people go to work as labourers, and covered quite a lot of depth with stories, different experiences, and their opinions.
11. 1 farmer (man; sarpanch). He owns a lot of land which is worked on by labourers; he himself does not tend to the fields. His mother used to be the sarpanch for many years, and she also has her own piece of land which is large. The only loan he took was to educate his daughters and to buy a tractor.
12. 2 farmers (couple) amidst other relatives (farmers; women). The total group in the conversation included 7-8 people, including some very young children. These farmers were resettled because of their dam project, with their parents being the first generation to move. They had houses next to each others' and worked on their farms together.
13. 2 managers (men) at the district cooperative bank. The bank was not too busy at the time of day, but people starting queuing up slowly.
14. 1 manager (man) at private bank. The area outside the bank was fully packed with both men and women farmers, and there was not a single place to stand. Inside, the counters were all occupied and the manager sat in his own office overlooking the counters.
15. 1 jeweller (man) who ran his own store with his daughter. They kept both silver and gold jewellery, and explained that gold jewellery was starting to become more common. The customer right before me came to pawn off one of her silver chains, and he mentioned this was extremely common during this monsoon season.
16. 1 manager (woman) at private bank specialising in gold loans. The bank was tightly guarded with a chained gate and a security guard. Before me, a woman came to pawn off a gold necklace. The woman and manager recognised each other well and the loan was made within 10 minutes. While speaking to the manager in her office, a few other people came in to take loans on their jewellery.
17. 1 store-owner (man) at agro-store (unrecorded). This man ran a small store with one employee. He sold inputs on credit if he knew someone well enough. He showed me his billing records for the last few days, which showed almost half of the customers having remaining dues they would pay post-harvest. He claims there have been no major issues of people not paying back, and explained that he usually knows the people well and also keeps their number and address.
18. 1 jeweller (man) (unrecorded). The jeweller took over his store from his father. He studied journalism but eventually decided to come back to the family business. He mentioned similar things to the previous jeweller: that people often came to pawn off jewellery at this time of year. He kept jewellery for five years and melted down the pieces that would not get taken back in this period.
19. 1 store-worker (man) at agro-store (unrecorded). This was a much larger store than the first one, with 5 counted employees, a cashier counter, and a storage facility from where employees were taking out more products. The manager mentioned not selling on credit ever because they are a bigger store and it would be difficult to keep tabs on who is borrowing.
20. Several farmers who work for an NGO (unrecorded). This conversation did not include the usual questions I would ask because of the size of the group, which was roughly 20 farmers together. Instead, I shared what my research was about, asked them their insights on it, and asked what kind of research they thought was relevant or needed. Most farmers were in their 20s, but two were in their 50s.

21. 1 manager (woman) at the women's cooperative, who is also a farmer. She manages the logbooks with the accounts. The cooperative had a substantial amount of space, where they held monthly meetings and often training courses to teach farmers additional skills (such as sewing) for additional incomes. In her own farming, she also grows cotton, among the other usual crops.
22. Repeat of N1, but with parents-in-law of older generation. This was a more extensive conversation with the in-laws, and went into depth about their experiences of farming and foraging.
23. 2 farmers from 1 generation (couple). The wife manages the farming work and husband is in contracting business. After his parents' land got divided between his siblings, there was not enough land left for them to live off of, and especially for the next generation. This, and the fact that his father did some light construction work, motivated him to become a contractor.
24. 1 weaver who was slightly elderly. His family (and community) did not own any land because they were consider 'lower caste' among the Adivasis. His children now study and do not know how to weave baskets. Because of this, he alone does the weaving, and during the sugar-cutting season, they all go to neighbouring areas where sugarcane is grown. This is usually with Patel and Patidar farmers who can grow sugarcane with irrigation.

Appendix B: Indicative questions

These are only rough indicative questions used during conversations with farmers. Many questions asked were based off of people's responses to allow for a more organic conversation flow.

1. What are the crops that you grow?
2. Do you remember what your parents and grandparents would grow when you were younger?
3. If parents would not grow cotton:
 - a. When did you start growing cotton?
 - b. What made you choose to start growing cotton?
4. When did you start with Bt cotton? What made you choose to start growing Bt cotton?
5. How is Bt cotton different than *desi* cotton?
6. What are the things needed to grow Bt cotton?
7. How do you cover the expenditures needed to grow Bt cotton, such as the seeds and pesticides that you mentioned?
8. How does it work with buying inputs on credit? How much do they charge for the inputs if buying on credit? What would be the regular price of these products?
9. What happens if there is a bad harvest one year? Where do you get the money to cover it from?
10. How much interest do the jeweller's charge? How long do they keep the jewellery before trying to resell it?
11. How much interest did the banks charge?
12. How do you think through returning the money taken on credit? Are there any specific things you have to do to pay the money back?
13. Are there other reasons for taking loans outside of farming necessities?
14. If any family member works outside the farm: where do they work? What kind of work do they do?

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