International Institute of Social Studies

Erasmus

India's Agro-Ecological Crisis and Debt Entrapments:
A Multi-Scalar Analysis on the Political Ecology of Indebtedness

A Research Paper presented by:

KARISHMA SHELAR (522211)
(India)

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

Major:

Agrarian Food and Environment Studies
(AFES)

Specialization:

Environment and Sustainable Development (ESD)

Members of the Examining Committee:

Julien-François Gerber

(Christina) C Sathyamala

The Hague, The Netherlands
December 2020

Disclaimer:

This document represents part of the author's study programme while at the International Institute of Social Studies. The views stated therein are those of the author and not necessarily those of the Institute.

Inquiries:

International Institute of Social Studies
P.O. Box 29776
2502 LT The Hague
The Netherlands

t: +31 70 426 0460
e: info@iss.nl
w: www.iss.nl
fb: http://www.facebook.com/iss.nl
twitter: @issnl

Location:

Kortenaerkade 12
2518 AX The Hague
The Netherlands

For Aai and Papa

Acknowledgements

In January 2019, as I picked up Muhammad Yunus's *Banker to the Poor*, an autobiographical account of Yunus's endeavours to make credit accessible and affordable to the poor women through the Grameen Bank, I was utterly fascinated. The tables turned as I was made to understand that credit-debt relations are not a matter of a simple exchange but one that involves several power dynamics and the scale and complexity only tends to get magnified as the proportions of debt balloon. I cannot thank Julien and Sathya enough for their support and guidance in helping me explore the dynamics of debt. It has opened a new realm of exciting opportunities for me and future researchers and provided me a pathway that I'll continue to explore. Julien, thank you for helping me envision this thesis even before I put pen to paper to my straying ideas and topics. I am grateful for your patience and thoughtful guidance throughout this year. Sathya, your feedback has helped me sharpen my skills as a researcher and taught me the nuts and bolts of good research.

If it takes a village to raise a child, then it takes many more to nurture a researcher. This thesis would not be possible without the contribution of family and friends. Endless debates with my mother on India's agricultural and political crisis kept me determined to stay the course. Himani has remained by backbone through the tough days and the dark times. Lucia, Nafeesa, Rupsha, Vinay, Gio and Aditya have been wonderful, kind, considerate and patient with me while guiding me through the wavering strands of research that I wish to pursue and helping me to "embank" each time I meandered away. Tejasvi, Neha, Sanchita, Amod and Arpita have been my bouncing board for ideas and very generous with their time. Rohini, Nitin and Sofia encouraged me to pursue my interests. The library staff at the ISS have been wonderful, kind and supportive. Andre and Geeta have kept my spirits up on the gloomy days with coffee and chocolates. It's been a roller coaster journey which comes to an end with this research and what a splendid one it has been. I'm grateful to everyone for sharing your knowledge, affection and friendship with me.

Contents

Glossary

Agricultural Labourer	As per the Census of India, a person working on another person's land for wages in money or kind or share.
Agricultural Household	A household which receives more than INR 3000 (USD 43) from agricultural produce with at least one member self-employed in agriculture either in the principal status or in subsidiary status during last 365 days.
Cultivator	As per the Census of India, a cultivator is engaged in cultivation of land not legally entitled to them.
Effectively Landless	All households owning less than 1 acre [0.40 ha] of land.
Gram Panchayat	The lowest tier of governance in India, part of the Panchayati Raj System introduced with the 72nd Constitutional Amendment to decentralize governance.
Green Revolution	A set of technologies such as high yielding varieties of seeds and complementary fertilisers and pesticides promoted by American institutions in the 1950s and 1960s for improving yields and per hectare productivity.
Kharif	Cropping season dependent on the south-west monsoons, between June to September. Some of the crops grown in this season are rice, oilseeds, maize, pulses, cereals and soybean.
Other Backward Classes	These are socially, economically and educationally disadvantaged groups protected through special provisions by the Constitution of India.
Rabi	Cropping season between December and March. Crops grown in this season are also known as winter crops. Wheat, barley, sesame, peas and mustard are some examples of winter crops.
Scheduled Caste	These are such castes, races or tribes or parts of such social groups who have been socially and economically marginalised and are protected through special provisions by the Constitution of India.
Small and Marginal Farmers	Those farmers owning less than two hectares of land.

List of Acronyms

ABM	Advanced Biological Marketing
AGF	Agha Khan Foundation
AIDIS	All-India Debt and Investment Survey
ADWWRS	Agricultural Debt Waiver and Debt Relief Scheme
CAMPA	Compensatory Afforestation Fund Management and Planning Authority
DOC	Deoiled Cakes
FAO	Food and Agriculture Organization
FCA	Forest Conservation Act
FCI	Food Corporation of India
GATT	General Agreement on Tariff and Trade
GoI	Government of India
HYV	High Yielding Variety
IOI	Incidence of Indebtedness
IMF	International Monetary Fund
INR	Indian National Rupee
IRDP	Integrated Rural Development Program
KCC	Kisan Credit Card
NABARD	National Bank for Agriculture and Rural Development
NCDEX	National Commodity and Derivative Exchange
NMCEI	National Multi-Commodity Exchange of India
MAKAAM	Mahila Kisan Adhikar Manch
MCX	Multi Commodity Exchange
MGNREGA	Mahatma Gandhi Rural Employment Guarantee Act
MMM	Maitree Mahila Mandal
MSP	Minimum Support Price
MT	Million Tonnes
OBC	Other Backward Classes
PACS	Primary Agricultural Credit Society
PDS	Public Distribution System
RBI	Reserve Bank of India
RRB	Regional Rural Bank
SC	Scheduled Castes
SHG	Self-Help Group
SPS	Samaj Pragati Sahyog
USD	United States Dollar
WB	World Bank
WFP	World Food Program
WTO	World Trade Organisation

Abstract

High levels of indebtedness and environmental degradation are at the core of India's agro-ecological crisis, creating extreme forms of marginalisation and agrarian transformations such that it leaves a large part of the population socio-economically and ecologically vulnerable. However, the two phenomenon must not be singled out and understood with a siloed approach. They are intertwined to each and are bringing about deep-rooted systemic shifts which are enforcing extreme forms of inequalities. The purpose of this study is to understand the mechanisms by which debt and environmental degradation are interlinked with each other such that they have exacerbated India's agro-ecological crisis. The study identifies three modes of linkages between debt and environmental degradation – dispossession, differentiation, and displacement; the biopolitics of debt; and commodification and financialisation of agro-commodities, in this case, soya. In the process, the study provides an overarching view of the financial landscape of debt rooted in environmental degradation and social relations of exchange – the types of debt, actors and institutions involved and parameters of environmental degradation.

Relevance to Development Studies

India, with one the largest populations in the world engaged in agriculture, over 600 million people, and more than 86 percent being small and marginal farmers is undergoing a rapid agrarian transformation towards corporatisation and financialisation of its agrarian systems. This will have brutal consequences for food and nutritional security and livelihoods of women, small and marginal farmers and the landless and for natural resources, mainly land and water. Much of this transformation is rooted in debt and environmental degradation creating extreme conditions of exclusion, displacement, dispossession, and socio-ecological violence. The geographies of indebtedness are not homogenous and static but are characterised by the intersectionality of caste, gender and class identities which have embodied exploitation. This study contributes towards understanding the relationship between debt and ecological degradation to support and in solidarity with social movements towards a transition to socio-ecologically just landscapes unchained from the burdens and brutalities of debt.

Keywords

Debt, credit, environment, degradation, gender, political ecology

Chapter 1
Introduction

In March 2018, close to 40,000 farmers marched to the state legislative assembly in Mumbai, the financial capital of India, from across the state of Maharashtra to urge the government to concede to its demands for loan waivers, secured tenure and resource rights to land and an increment and assurance of the state declared minimum support guarantee prices (MSP) for its crops (Parth, 2018). Come November 2018, over 200,000 farmers from all over India gathered in New Delhi, the capital of the country, to draw the government's attention to rural distress and the mounting agrarian crisis (K. Agarwal, 2018). It is interesting to note that these marches brought together farmers across classes, caste groups and gender for the range of issues that they pursued and the differentiated gendered impact of rural distress on such groups (PARI, No Date; Dhawale and Prashad, 2018). These were not siloed and secluded protests. Over the past five years, several farmer unions have organised demonstrations and protest marches to call out the state's systematic attempt at depriving the small and marginal farmers, the landless and women of their right to earn a livelihood with dignity, also enshrined in India's Constitution under Article 21.

Fast forward to September 2020 in New Delhi where farmers from the neighbouring states of Punjab and Haryana, over 3000 in number, some with tractors while others on foot, conglomerate to protest the national government's act of passing three farm-related ordinances aimed at reforming markets for agricultural produce by favouring agri-businesses. These are the Farmers' Produce Trade and Commerce (Promotion and Facilitation) Bill, 2020, the Farmers (Empowerment and Protection) Agreement on Price Assurance and Farm Services Bill, 2020 and the Essential Commodities (Amendment) Bill, 2020, henceforth referred to as farm ordinances (EPW Editorials, 2020b, 2020a; Singh, 2020). These ordinances essentially underline the route of corporatisation of India's agriculture through free market price mechanisms hinting at eventual withdrawal of state support to agriculture. The protests were more pronounced in Punjab and Haryana who contribute to the bulk of the purchase of wheat and rice by the government at an assured price but remain highly indebted from the pitfalls of the Green Revolution.[1]

While the dichotomy of the protests in Mumbai (2018) and New Delhi (2020) in terms of class, caste and cause are evident, these are indicative of the larger agro-ecological crisis brewing in rural India over the past three decades. At the crux of the crisis, lies the problem of indebtedness among rural agrarian households and one of environmental degradation. This provides the basis for investigating the dynamics of agro-ecology and indebtedness in India. Further, it is critical and urgent to understand if the occurrence of indebtedness and ecological degradation is a co-incidence or is there a co-relation? This research aims to decipher the hypothesis on the mechanisms of the relationship between indebtedness and environmental degradation, whereby the two phenomenon reinforce each other to exacerbate an agro-ecological crisis.

[1] Refer to the glossary.

1.1 A Panoramic View of India's Debt-Laden Agro-Ecological Crisis

More than 600 million people in India, over 50 percent of its population, depend on agriculture and forests for livelihood security and around 85 percent of the agricultural land-holdings are small and marginal (less than two hectares). Further, more than 52 percent of India's agricultural households are indebted (NSSO, 2016; GoI, 2018a). Between, 1992 and 2015, India's debt to asset ratio for a farming household expanded by 630 percent (Kandikuppa, 2018). Understandably, a loan waiver remains a persistent demand of the farmers to allow for a transition to debt-free agriculture. In 2008, the GoI introduced the Agricultural Debt Waiver and Debt Relief Scheme (ADWDRS) under which the highest loan waiver in the history of post-independence India equating to INR 525.16 billion (USD 8.4 billion) of loans granted by institutional sources were waived off for farmers (S. Raj and Prabhu, 2018, p.2). In the past 5 years, loan waivers have prominently featured in election manifestos. In 2016-17, the states of Uttar Pradesh, Maharashtra and Punjab announced loan waivers amounting to INR 770 billion (USD 11 billion). However, the benefits of such waivers do not percolate to the landless, small and marginal farmers, and those with conflicted land titles. This is because only 15 percent of such farmers can access institutional credit with caste, class and gender becoming a critical factor in the process (Rajeev, Vani and Bhattacharjee, 2011; Banik, 2018; Rajeev and Nagendran, 2018).

India faces a substantial groundwater crisis with the rate of extraction of groundwater escalating by 92 percent since the 1960s making India the world's largest user of groundwater (Srinivasan, 2017). Further, nearly 30 percent of India's land is undergoing desertification – a process of "land degradation in arid, semi-arid and dry sub-humid areas resulting from various factors, including climatic variations and human activities leading to loss of productive ecosystem and biodiversity" (GoI, 2016, no page number). Notably, a majority of India's agriculture is practiced in semi-arid areas. While environmental degradation is attributed to anthropogenic factors, deforestation and extreme climate events such as droughts, the dynamics of indebtedness are often excluded from or are limited to a risk or a vulnerability in mainstream narratives of environmental change (Lambin *et al.*, 2001; IPCC *et al.*, 2014; Benjaminsen, 2015).

The year 1991 remains a critical marker for India's economy. India liberalised its economic and agricultural policies in 1991, succumbing to global pressure tactics from Bretton Wood institutions – the World Trade Organisation (WTO), World Bank (WB) and the International Monetary Fund (IMF) after it secured a loan of USD 4.8 billion from the IMF. Such a move further eroded the autonomy of the farmers worsening the agrarian crisis which at the time was reeling under the stagnation effect of the Green Revolution (Patnaik, 2003, p.35). The spill over continues to haunt India's agrarian sector where rice and wheat, patent crops from the Green Revolution, constitute more than 70 percent of India's agricultural production (PRS India, 2017). Indebtedness, then, becomes a critical factor driving agrarian transformations not just socially, politically and economically but also ecologically. To study such a complex phenomenon, this study adopts a multi-scalar and intersectional approach across 8 agro-ecological zones in India at the household, agri-business and national level through a set of cases. It must be noted that a group may be categorised as farmers or peasants based on its level of subsistence, reproduction, access to land, market participation and dependence and engagement with the social network (Bernstein, 2003; Akram-Lodhi and Kay, 2010; O'laughlin, 2016). Based on the classical and contemporary debates, and the recognition that the hierarchy of endowments necessary for subsistence or surplus is situationally and seasonally varied and the impact of the agro-ecological crisis differentiated, this study prefers to use the term farmers (Patnaik, 1988, p.303).

1.2 The *'Two-Faced'* Debt

The nature, utility and productivity of debt have been long argued among its proponents, opponents and the sceptics (Gerber, 2013; Taylor, 2013; Ramprasad, 2019). Credit-debt relations have been characterised by social patterns of exchange such that they could be mutually beneficial to the community where such transactions occurred and profit was not a consideration in such relationships (Graeber, 2009, pp.8-9). Further, credit is also considered a critical component for asset creation, as a medium of financial inclusion and for meeting the aspirations of households. For several women self-help groups, credit was an important medium for exercising their agency in the household, to escape domestic abuse and for financial empowerment, until it became a mode of exploitation (Joshi, 2020; Mullassery Sathiamma, 2020).

As the debate progresses, the spurt of indebtedness and the changing nature of capital and credit with the financialization of agrarian economies has remained a constant (Green, 2020). This is manifested through appropriation of surplus value which equates to profits, alienation of labour, social differentiation, unequal terms of exchange, relations of exploitation and harmful environmental impacts (Luxemburg, 1968, pp.38-9; Taylor, 2013, p.701; Ramprasad, 2019, p.1290; Green, 2020, p.2).

Such credit-debt relations are then fostered by capitalist processes of production whereby surplus capital accumulation becomes "ad infinitum" (Luxemburg, 1968, p.39). Credit and debt become instruments to achieve such a surplus value to serve expanding production and consumption processes. Further, every cycle of production involves social reproduction critical to grease the wheels of capitalism. Credit-debt relations, then, also impact the means of social reproduction. The natural environment, land, resources and labour are important sources for reproduction that serve the interests of capital formation, production and expansion (Luxemburg, 2013, p.551).

The impact of the complex credit-debt relations are also manifested in the decision-making and policy formulations at the national, state and household levels on agro-ecological landscapes (Gerber, 2013; McMichael, 2013; Li, 2015; Taylor and Bhasme, 2019; Green, 2020). The internationalisation of agriculture through unfair trade regimes and structural adjustment programmes across Latin America and Africa as 'debt' for development are well documented and capture loss of local food security, biodiversity and an increased financial dependence on Bretton Wood institutions (Raynolds *et al.*, 1993; McMichael, 2007; Patel and McMichael, 2009; Patel, 2013). Access to and control of natural resources, including commons, are often controlled by credit-debt relations. This not only constrains the agency of the individual and the household based on caste, class and gender dynamics, but also exacerbates vulnerability of the marginalised farmers and the landless (Taylor, 2013). The choices made by such households are heavily forced by institutional and structural constraints (Agarwal, 2014, p.1256). The social dynamics of credit-debt relations then become a debt-cum-poverty trap, reinforcing social hierarchies of discrimination and differentiation (Taylor, 2013).

1.3 Objective of the Study

This research thesis is an effort toward systematically historicising and capturing the relationship between debt and the environment through an agro-extractivist and feminist political ecology approach by conceptualising the relationship through 'geographies of expulsion' (Sassen, 2017). It aims to understand whether debt functions as a constraint to undertake decisions which are environmentally unsustainable. It is also an opportunity to analyse

ecological degradation from the lens of indebtedness and interweaves the political economy, agro-extraction and a feminist political ecology perspective on debt.

1.4 Research Questions and Sub-questions

My research questions and sub-questions are as follows –

- What is the relationship between debt and ecological degradation manifested through land-use based decisions undertaken by the state, companies and family farms in India from a feminist political ecology approach?
    - What is the role of credit-debt relations, in exacerbating environmental degradation in India?
    - What is the role of environmental degradation, in furthering indebtedness among agrarian communities in India?
    - What is the role of credit-debt relations, in constraining agro-ecologically sustainable decisions at the state and household level?
    - To what extent does the feminisation of debt impact decisions related to lands and alter intra-household decision-making?

To do so, the thesis will work towards building four sections to understand the relationship between debt and ecology. First, an analytical framework to situate and explain the conceptual and theoretical underpinnings of the study (Chapter 2). Second, a historical analysis from the mid-19th century to contextualise the role of credit-debt relations in influencing land-based decision-making (Chapter 3). Third, a causal analysis between ecological degradation and debt operating through three mechanisms – dispossession and differentiation (Chapter 4), the biopolitics of debt (Chapter 5) and commodification and financialization of the market of soya (Chapter 6). Fourth, interspersed through the three mechanisms which spell out the relationship between debt and ecology, there emerges a classification of the types of debt (e.g. formal, informal, etc.), actors and institutions involved (e.g. peasants, moneylenders, banks, cooperatives, multilateral and bilateral institutions, etc.), levels of debt (e.g. household, state, national, etc.) and parameters of agro-ecological degradation (Chapter 7).

To meet the objectives of the research, my umbrella approach remains one of feminist political ecology while my theoretical framework is based on Sassen's 'geographies of expulsion' created through extractive economies. Within this theoretical framing, I leverage concepts of dispossession and displacement by accumulation, the biopolitics of debt and agro-extraction through financialisation and commodification which are discussed in the next chapter.

Chapter 2
Methodology

The multi-scalar and intersectional nature of the research required me to adopt an approach and theoretical framework suitable to understand the complex dynamics of the relation between debt and ecology. This was complemented by mixed methods of research for data collection and analysis which included literature review, semi-structured and informal interviews, secondary data analysis, a study of cases, policy mapping and analysing of political decision-making at the state and national level.

This chapter aims to spell out the overall approach and the theoretical framework for analysing data and provides conceptual clarifications to the reader. It then discusses the methods adopted for data collection and collation – literature review, qualitative interviewing and case study research. It concludes by sharing the scope and limitations of the methodology. The ethical approach and positionality are clarified in the methods section.

2.1 Theoretical Framework for Analysis and Overall Approach

The theoretical framework of this research is based on Saskia Sassen's body of work on 'geographies of expulsion' where she discusses the modes, instruments, channels and processes (Sassen, 2014, pp.1-4) which create a 'systemic edge.' This is "a site where general conditions take extreme forms precisely because it is the site for expulsion or incorporation" (Sassen, 2014, p.211). Sassen describes these expulsions to be "subterranean trends" (Sassen, 2014, p.211) since these are issues which are hard to decipher and quantify and do not quite explain the extreme nature of the problem at hand because we are looking at them based on our existing "geopolitical, economic and social markers" (Sassen, 2014, p.5). These are often cross-cutting and are indicative of larger systemic problems which have manifested themselves overtime in a variety of ways such as displacement, droughts, dispossession, environmental destruction and food insecurity. However, we fall into a trap of using singular siloed lens of familiar research and knowledge streams to explain such issues. Sassen suggests that there is an urgent need to go beyond these familiar explanations and to look at larger underlying trends which have contributed to creating "predatory formations" (Sassen, 2014, p.13). These are a mix of elite societal structures and systems that enable large-scale concentration and lead to expulsions which emerge from extreme conditions and "takes us beyond the more familiar idea of growing inequality" (Sassen, 2014, p.1) to systemic brutalities. The expulsions function through assemblages which include a wide variety of knowledge systems, technologies, practices and governance structures (Sassen, 2013, p.27) and through principles of extraction – an act of resource extraction from one site for value addition at another site while leaving the original site of extraction irreversibly damaged.

Further, these predatory formations are complex in nature, encompassing such assemblages which cannot be dismantled by singular policy responses and are entrenched in existing systems of extraction. Such geographies of expulsion also make invisible the expelled. One critical factor for creating such expulsions is the financialization of our economic systems which Sassen refers to as "high finance" (Sassen, 2010, p.25). She identifies finance to be an extractive sector (Sassen, 2017, p.4). To simply put, these are complex systems involving financial instruments oriented towards profits from speculation than asset creation and consumption. In addition, debt servicing also functions within the larger assemblages of factors creating conditions for expulsion while functioning as "regimes of discipline" (Sassen, 2010, p.85). The speculative and extractive logic put forth by Sassen to the financialization

of global systems must be understood as one which goes beyond the conventional understanding of value extraction to one generating expulsions (Sassen, 2013, pp.26-7). This links well to Akram-Lodhi's "highly internationalised circuits of capital" (Akram-Lodhi, 2007, p.1449) based on speculation and functioning through multiple sectors, commodity or geopolitical regions. Thus, the framework on the 'geographies of expulsion' offers an insightful lens to understand the on-going agro-ecological crisis in India encompassing high levels of indebtedness and environmental degradation.

However, a major drawback of Sassen's 'geographies of expulsion' in its current form is the focus on the middle-classes and homogenising the differentiated impacts of the 'geographies of expulsion'. Further, the literature on the political economy of indebtedness and credit in agrarian societies discusses its ramifications at the household, community and sectoral levels, including gender relations, albeit, only partially interweaves the impact on ecosystems. The current literature which hints at the relationship between indebtedness and ecology feature some common strands of thought based on the political economy of debt, food sovereignty, financialization of agriculture, an increasing internationalisation of credit-debt relations between the global north and the global south and corporatisation of agricultural inputs (McMichael, 2007, 2013; Patel and McMichael, 2009; Agarwal, 2014; Li, 2015; Ouma, 2016; Gerber, 2014; Padhi, 2009; Raynolds et al., 1993; Singh et al., 2017; Shandra et al., 2005). Further, a systemised theorisation of the political ecology of indebtedness also remains sparse and scattered (Gerber, 2014).

However, credit-debt relations in rural agrarian communities are complex, gendered and manifested through intertwined nodes of exchange which are socio-economically hierarchal in nature. These include state created institutional structures, informal networks, social institutions, natural resources and markets. Further, the intersectionality of social identities such as gender, caste, race and class influence the mechanisms of exchange with potential impact on the environment. To analyse this web of socio-political, economic and ecological relations requires a theoretical approach which offers a lens to grasp the plural and complex nature of such intersectionality (Elmhirst, 2011; Nightingale, 2011; Sato and Soto Alarcón, 2019). For this purpose, my umbrella approach remains one of feminist political ecology which offers me the ground and the clutch to analyse the impact of credit-debt relations on the environment and vice-versa while allowing me to introspect the 'geographies of expulsion' from an intersectional lens.

2.1.1 Embedding Environmental Degradation to Logic of Extraction

Environmental degradation is a multifaceted phenomenon and may be defined differently based on the scope, scale and context of a study (Benjaminsen, 2015; Ghazoul and Chazdon, 2017). For this research paper, environmental degradation is to be understood from the lens of extraction and excessive use of natural resources beyond the capacity of the natural ecosystem to sustain and replenish itself. It is a form of environmental change experienced and embodied by communities that has altered the relationship, knowledge systems, traditional rights and resource access of communities to their environment, specifically to land and water resources (Agarwal, 1992, p.127; Elmhirst, 2011, pp.129-31). The consequent impacts vary based on the intersectionality of the identities embodied by the people and based on their relation to the land. This also shapes their responses in the form of resistance, migration or shift to alternatives based on their social hierarchies, socio-cultural and ecological context. While I recognise the value of quantitative methodologies to measure degradation, to unpack the complex relationship between debt and ecology required me to adopt a socio-culturally embedded lens for degradation – "a process driven by decisions made in the context of socioeconomic conditions, political structures, and biophysical constraints, or as an

ecosystem state in which certain valued attributes of the ecosystem are impoverished or lost" (Ghazoul and Chazdon, 2017, p.165).

For the purpose of analysing the linkages between debt and ecology contributing to India's agro-ecological crisis, I specifically focus on land and water resource extraction as a form of environmental degradation. I adopt the traditional approaches to understanding extractive economies and further link it to Sassen's logic of extraction. Simply put, ecological extraction is based on extracting of natural resources as raw materials from one geography, only to be transformed and consumed through value-addition in another geography. However, the benefits of such a transformation are not only unevenly distributed but also produce socio-economic and ecological disturbances in the geographies of extraction (Bunker, 1984, p.1019). Such geographies are unique for "natural resources can only be extracted where they occur, and agriculture depends on soil fertility, climate, and relatively large proportions of surface space" (Bunker, 1989, p.591). However, uneven power relations, compounded by debt bondages to the global north force such geographies to become merely price takers, making them overtly dependent on such resource extraction for repayment of debt and for economic sustenance. More recent debates have classified such a phenomenon to be one of neo-extractivism whereby such economies diligently deploy extraction as a development pathway for poverty alleviation (Burchardt and Dietz, 2014, pp.468-9). Control and resource mining are essential features of extractivism and neo-extractivism and the activities are centred around resources that cannot be reproduced but merely exploited. The logic of extraction then functions across three levels. First, necessary infrastructure made operational through a close collaboration between the state and private entities. Second, the functioning of an operational centre controlled by a monopolistic group. The third is the flow of resources from the site of extraction to the site of appropriation which is the operational centre. This value-shift is merely consumed by the centre while the site of extraction faces severe ecological damages and exhaustion of resources (Ye *et al.*, 2020, p.156-160). These impacts are embodied by communities residing on such sites of extraction and thus become biopolitical in nature.

2.1.2 Locating the Biopolitics of Debt within Geographies of Expulsion

Land is a critical resource supporting food security, livelihood, fodder, and fuel needs of communities, but it is also a highly gendered resource and holds a diverse set of socio-cultural values. Land is increasingly being subjected to a set of assemblages to render it available to meet the needs of capital accumulation while intruding upon customary community centred use and access (Li, 2014, pp.590-91). Further Akram-Lodhi expands the idea of land to a landscape which embodies three elements – the material landform which includes crops, trees, shrubs and other natural resources; the abstract elements of the ecology such as climatic conditions and finally, a cultural context within which these elements are socially embedded. Commodification becomes a process of uprooting land, the material landforms and other natural resources from these elements to become alienated assets subjected to the compulsions of the market (Akram-Lodhi, 2007, p.1439; Bernstein, 2010, p.102).

Debt relations are a critical factor contributing to further commodification by promoting export-oriented agrarian structures. These emerge from an increased demand of value-added agricultural products mainly produced for the export market concentrated in the global north. Driven by profit orientation, such commodification reinforces certain assemblages of technology, market access, knowledge, inputs, and finance. For sustaining and expanding profits also requires additional rounds of credit which reinforces a cycle of indebtedness among the producers. This further intensifies the financialization of agricultural produce giving rise to innovative, complex, and multi-scalar financial instruments operating through

several parties which may be geographically dispersed. These are often speculative in nature such as derivatives which thrive on mere speculation rather than physical trade of goods and is directed at profit-orientation. This also involves a process of "dispossession of the peasantry" (Araghi, 2009b, p.122) from its lands and of its assets. This occurs through mechanisms of "accumulation by displacement" (Araghi, 2009, p.118) and social differentiation. Here, accumulation is a product of surplus value which is extracted through improved and increased production, however, the benefits of which are concentrated in the hands of a few while depriving and marginalising large sections of the population (Akram-Lodhi, 2007, p.1453). This contributes to the creation 'geographies of expulsion.'

Using the feminist political ecology lens, I explore the bodily harm inflicted by debt and its relation to agro-ecological landscapes, specifically to certain crop types. For the purpose of this thesis, I refer to this as the biopolitics of debt. I rely on Kinkaid's (2019) analysis of agrarian change through the embodied experiences of the Green Revolution in India for how such experiences "may register, mediate, shape, reproduce, resist, or disrupt broader social, environmental, and economic dynamics and trajectories" (Kinkaid, 2019, p.47). Further, I build upon the idea that commodification and financialization of agriculture force debt-servicing engagements which not only have gendered bodily impacts but are ecologically damaging for the environment. Much of this is also driven by speculative demands and investments whose impacts are then embodied by farmers and the environment alike. Here, I rely on Nightingale's theorising of "how material environments extend from and into the body with profound implications for social difference, space and ecologies" (Nightingale, 2011, p.153).

I situate my analysis within this theoretical framework to not only explain the brewing agro-ecological crisis in India, but to also identify potential threats emerging from such a crisis which remains invisible to current systems of assessment.

2.2 Methods

I adopt a mixed research methods approach for primary and secondary data collection, collation and analysis which are elaborated in the succeeding sections.

2.2.1 Literature Review

A literature review was carried out to identify existing literature formulating a relationship between ecology and debt; to check for existing arguments, agreements, disagreements and potential gaps to be filled; and to check for theoretical approaches, methodologies and methods utilised. I also identified literature exploring the historical occurrences of indebtedness in agrarian societies and the political economy of debt, literature on political ecology specifically land and natural resource degradation and the body of work of feminist political ecologists. The literature review covered three databases – SCOPUS, GEOSPACE and ProQuest Platform. These were selected for having databases related political ecology, political economy, sociology and economics. A set of steps were followed to filter the results based on the functionality of the database:

- Boolean operators, truncation and wildcard functions were used as per the functionality of the database.
- Since the ProQuest Platform searches across sixteen databases, this was reduced to one, International Bibliography of the Social Sciences (IBSS).

- For SCOPUS and GEOSPACE, if the set of results was over fifty, key words, 'debt', 'ecology', 'agriculture', 'environmental degradation', 'environment protection', 'ecosystem service', 'finance', 'profit' or 'incentive' were applied to filter the results.
- Based on the results, I used my personal discretion to decide on the literature selection based on relevance to the objective of the thesis and the research questions.

I have also relied on literature recommended by academicians and which have not featured in the digital search, thus, also acknowledging the limitations of the digital resources to study the relationship between debt and ecology. The findings of the literature review are interweaved in the empirical chapters to study the linkages between debt and ecology.

2.2.2 Interviews

I carried out nine semi-structured interviews and two informal interviews through virtual platforms such as Skype and Whats App audio calls. The respondents were selected based on their affiliations to institutions, social movements, advocacy groups, agri-businesses and civil society organisation. They represent a variety of classes, castes, gender and geographies to align with the intersectional nature of the study (Appendix A). The questions were formulated to validate the hypothesis of establishing linkages between indebtedness and environmental degradation (Appendix B). The interviews were conducted in English, Hindi and Marathi. The interviewer was explained the purpose of the interview. In the event of when the interview was recorded using an external or in-built audio recording device, the interviewee was informed, and consent was asked for prior to the recording. Handwritten and digital notes were prepared based on the interviews which were utilised for empirical analysis. Information shared by the interviewees were validated with other interviewees and through the literature review.

Based on the interviews and the literature review, I focus on three specific cases to respond to my research questions and to understand the dynamics of relationship between indebtedness and environmental degradation at the scale of the household, landscape and agri-businesses. The cases provide a holistic context of the situation and while being situated in India, they are geographically limited to the states of Punjab, the Malwa region of the state of Madhya Pradesh and the district of Tonk in Rajasthan. The evidence for the case was generated using 'triangulation' involving methods of literature review and interviews.

2.3 Scope and Limitations

To meet the objective of the research thesis, the geographical scope of the study is confined to India. However, the issue of credit entrenchment, debt and indebtedness of the agrarian communities and its impact on land-use decisions and if such decisions are environmentally sustainable are closely linked to the global commodification and financialisation of agriculture. While the global exchange of raw material through trade systems and its influence on local social structures and relations to land through differentiation and accumulation are recognised, the trend of corporatisation of agriculture has made such networks more intertwined and complex.

With the limited resources, the study is then confined to a set of selected case studies and does not cover the spectrum of the social hierarchies and the social identities, agro-ecological crisis and consequent environmental conflicts facing us today. This thesis, then is an effort toward highlighting the agro-ecological crisis from the lens of debt. I also acknowledge the issue of indebtedness among the Indian farmer to be a humanitarian crisis,

however, I have been unsuccessful in speaking to farming families impacted by debt and have relied on a variety of actors that I believe are partially representative of the broad set of concerns faced by the agrarian households today.

Chapter 3
A Brief History of India's Agricultural Credit and Environmental Policies

The impact of credit-debt relations on the ecology, encompassing both informal and formal credit mechanisms, is complex. This is because the network of credit flows is complicated and interconnected to policy decisions which must be unpacked to understand the larger ecological consequences. Further, the informal credit networks are embedded in social hierarchies. Informal credit systems have played a critical role and continue to serve the bulk of the credit requirement for the reproduction of agrarian communities. However, the scope of this chapter is limited to mapping out the complex nexus of agricultural, credit and environmental policy decisions. This is primarily to chart the role of the state in coaxing a 'credit for growth' approach which has led to high levels of indebtedness among agrarian households, including dependence on informal credit, while causing considerable ecological degradation.

The chapter draws on literature reviews and guidance from interviews to provide a snapshot of the policy regime in the colonial period, and the spill-over effect on decisions related to land, agriculture and forests in post-independence India. It concludes by providing an overview of liberalised trade policies and transnational finance in exacerbating India's agro-ecological crisis.

3.1 An Overview of Colonial Credit Systems and Environmental Policies

Historically, global trade relations are based on unequal terms of exchange. Industrialised economies in the global north have enforced exports of primary raw materials, potentially harmful or not adequately suitable to the agro-ecological conditions in the global south. This caused a shift in cropping patterns from staple food grains to cash crops. In the colonial era, tax systems introduced to make efficient revenue collection mechanisms for the British, dismantled local agrarian systems and consumption patterns of the population. Succumbing to the tax burden, local consumption shifted to inferior staples, while superior grains such as wheat and rice became export commodities. In drought years, the household was forced to borrow to pay taxes and for consumption. This led to a decline in nutritional standards, periodic famines, heavily indebted households and land concentration in the hands of upper and middle castes (Banaji, 2002, pp.101-6; Patnaik, 2016, pp.122-23).

While the Indian subcontinent was always part of globalised trade linkages, the nature of the commodity changed from food crops to cash crops, also enforcing changes to land uses to serve colonial interests. For example, to insulate the industry in England from uncertainties of price and produce of cotton from America following the Civil War, the East India Company switched to sourcing cotton from its colonies (Banaji, 1977, p.1400). The Indian subcontinent with its tropical conditions most suitable to growing cotton, became a primary exporter to England. In addition, the land tenure systems introduced by the British, the zamindari, the ryotwari and mahalwari, mainly for the collection of revenue has been attributed to increasing indebtedness in rural pre-independence India which also inflicted differentiation and dispossession among the peasants (Schrader, 1997, 102-3).

Attempts to formalise credit disbursal and to regulate rates of interest were made through several legislations, the prominent one being the Cooperative Credit Societies Act of 1912. The Reserve Bank of India set-up in 1935, the apex institution for guarding and

expanding commercial banking services in India was tasked to improve credit uptake among agriculturalists away from moneylenders and the cooperative set-up (Mohan, 2006, p.1015). However, the period of the Great Depression in the 1930s followed by the onset of World War II had severe ramifications for the agricultural community in India. A sharp fall in the global prices of the agricultural commodities and the non-negotiable pressure of tax payments added to the indebtedness among the rural households, furthered peasant differentiation and dispossession of its lands. As a result, credit crisis impacting the money lending classes and the commercial farmers ensued (Bayly, 1985, p.595). This prompted the British to heavily invest in developing the canal network into prosperous areas such as Punjab which exported wheat to England, but also to placate the agrarian communities who served in the armed forces under the British (Bayly, 1985, p.593). This was mainly done by extending credit through the cooperative societies. So, it is no coincidence that Punjab became one of the recipients of the Green Revolution assemblages in the post-colonial period. However, unlike England, the cooperative societies remained in the clutches of socio-politically powerful castes and moneylenders. Credit-debt relationship between the moneylenders and the share-croppers, tenants, peasants and agricultural labourers remained central to the processes of reproduction for agrarian households. Enmeshed in caste and class hierarchies, such relations were a source of exploitation, accumulation and displacement for agrarian households in several ways. Debt pillage from previous unpaid dues lead to loss of lands among the peasants. As cultivators, the peasants were not only forced to sell their produce to the landlords who doubled as creditors but were often forced to produce a certain crop type. Malpractices with mathematical calculations on principal and interest amounts by the moneylenders maintained the vicious cycle of debt-bondages and poverty among the debtors (Mihir Shah, Rangu Rao and P. S. Vijay Shankar, 2007, pp.1351-2).

3.2 India's Tryst with 'Planned' Growth and the Colonial Policy Hangover

There are three prominent features of post-colonial credit, agricultural and forest policy. First, India's adoption of a planned approach to development – a top-down bureaucratic policy formulation approach embedded in foreign policy relations of the newly independent state. Marred by the experiences of the Bengal famine and millions of displaced families from the partition between India and Pakistan, food security was a primary concern for the government. To expand its agricultural production and to improve food security, India received technical and financial assistance from the Ford Foundation and the Rockefeller Foundation in the politically tumultuous times post-independence. India was also a net-importer of food crop which financially burdened the exchequer. Consequently, community development programmes aimed at developing model villages based on a Gandhian vision of local decentralised village economies were replaced by the 1960s with singular focused projects to increase food grain production (Sinha, 2008, pp.57-8).

Second, state control over land resources through land reforms and the implementation of the Forest Conservation Act, 1980. The first All India Rural Credit Survey conducted between 1951-52 stated, "owned land is the basis of creditworthiness" (Thorner, 1960, p.953). Accordingly, India introduced a series of measures with the objective to improve the acreage under cultivation with the 'Grow More Food Scheme' at the crux of which entailed a series of land reforms. India adopted a federal structure of governance post-independence and every state was constitutionally entitled to bring about its land reforms. Bureaucratically, land is administered in India by two departments – the revenue department and the forest department (Chaturvedi, Shelar and Singh, 2018, p.17). Thus, India's history of tenancy reforms, land rights redistribution, and laws governing its land and forests differ from one state

to another and were unevenly implemented (Ghatak and Roy, 2007, pp.251-2). However, in several states, as forest boundaries were being reconfigured post-independence, there emerged conflicts between the forest department, the revenue department and local communities. Redistribution of land parcels to the landless on conflicted land further complicated the issue on the ground. In accordance with the agricultural planning adopted in this phase, land under cultivation was increased "by extension of cultivation to fallow and cultivable wasteland" (GoI, 1976, p.13). Such fallow and cultivable wasteland were common resources, and this pattern followed the colonial policy of the 'enclosure of the commons.' For the government, land distribution schemes were critical to make "efforts to make private landed property the basis for a progressive agrarian capitalism" but was also seen as a means of redistributive social justice (Sinha, 2008, p.62; Reddy, 2016, pp.106-7). Thus, the formalisation of land titles aimed to serve a two-fold agenda of food security by adopting a land-to-the-tiller approach. Second, by improving the credit uptake among the agriculturalists from formal banking institutions, away from the informal network of moneylenders which dominated the financial services landscape in colonial India. To expediate the process, 14 commercial banks were nationalised in 1969 to improve commercial credit toward agriculture. The RBI aggressively pursued a strategy to bank the "unbanked" (Mihir Shah, Rangu Rao and P. S. Vijay Shankar, 2007, p. 1354).

This period also coincided with the Green Revolution when high yielding variety of seeds of rice and wheat were promoted among agriculturalists. To further entrench credit for agriculture to rural areas, Regional Rural Banks were set-up in 1975, followed by NABARD in 1983. While this doubled the share of agricultural credit from institutional sources between 1971 and 1991, this credit distribution benefitted certain classes, castes, gender and regions. Coincidently this period aligned with the introduction of subsidised electricity regime which eventually took the form of free electricity for farmers in several states. At the same time, there was an upsurge in the use of private tubewells as the main source of irrigation which benefited from the free electricity programs and credit access (Dubash, 2007; Sarkar, 2020). As evident, credit-based growth was a critical part of India's planned development approach.

Third, there was a policy shift from land-based reforms to anti-poverty alleviation measures through subsidised credit programmes such as the Integrated Rural Development Program (IRDP) and the self-help group linked microfinance programmes. These aimed at providing subsidised credit to poor households for entrepreneurial ventures with the objective of asset creation and ownership among such families, and eventually to improve their creditworthiness (Pulley, 1989). The IRDP, however, only added to the indebtedness of the poor while also plunging the banking sector into further debt, which finally led to a closure of several rural bank branches in the post-liberalisation period. It benefitted the rural capitalists and forced development projects not suitable to the ecological conditions of the poor. For example, the disbursal of loans to purchase cattle for milk production aligning with World Food Programme supported 'Operation Flood' to expand dairy production in India. While the experiment succeeded in some parts of the country with supported infrastructure, in several other regions, the cattle owners faced problems of fodder, cattle disease and eventual death of the cattle. Thus, leaving them with a debt to pay, but no asset to produce enough remuneration to repay the debt.

This must also be looked at from the "unfinished agenda of land reforms" (Reddy, 2016, 106) and misdoings of the Forest Conservation Act, 1980 (FCA). The enactment of the FCA, and the 42nd constitutional amendment passed in 1976 were a significant turning point for the forest dwelling and dependent communities in India. The later mandated forests which was formerly a state subject to now be under the joint jurisdiction of the national and the state governments and paved the way for implementing the FCA. With the FCA, all diversion of forest land for non-forestry purposes required monetary compensation of the full net-

present value of the forest to be deposited in the Compensatory Afforestation Fund set-up under the Act. The funds were meant to be shared with state governments and utilised for 'planting' compensatory forests. Thus, the colonial paradigm of revenue generation and monetisation of India's forests resources continued. Since 1980, India has diverted 1.5 MHa of forest land for development projects. The largest area was given over to mining (4,947 sq.km), followed by defence projects (1,549 sq.km) and hydroelectric projects (1,351 sq.km). However, the compensatory afforestation has not only led to monoculture plantations as compared to biodiverse and ecologically suitable tree species, it is also forcing a further loss of commons. The CAMPA funds are being utilised on common lands without prior approval of local communities, and with no rights to local communities over these newly afforested areas.

This period also ushered mechanisation of agriculture with a considerable rise in the use of tractors, tubewells and an increasing dependence on private agencies to provide for seeds and other agricultural inputs. With the emergence of the World Trade Organisation (WTO) and the influence of the International Monetary Fund (IMF) and the World Bank, there was a shift in focus toward laissez faire policies for economic growth and a reduced investment in agriculture. The period culminated with the government allowing a 100 percent equity in the seed industry, which opened the floodgates for private entities to now dominate seed production and distribution (Mohanty and Lenka, 2016, pp.172-3).

3.3 The Rush for Economic Liberalisation and its Dilemmas

The year 1991 marks a critical phase for the transition of the Indian economy toward liberalising its trade, industrial, financial and most importantly, agricultural sector based on the diktats of the IMF, World Bank and the WTO (Sinha, 2004, p.25). To meet the severe foreign exchange and balance of payment crisis, India borrowed USD 4.8 billion from the IMF as loan (Patnaik, 2003, p.35). India, was a member of the General Agreement on Tariff and Trade (GATT) treaty set-up in 1948 to allow for free trade and subsequently to "promote efficient allocation of world resources" (Gulati and Anil Sharma, 1994, p.1856) by abolishing trade distorting subsidies on agricultural produce. It eventually signed the Dunkel Draft trade agreement which sought to further 'free trade' as a virtue of productive use of resources and became a member of the WTO which replaced the GATT in 1994 (Thomas *et al.*, 1994, p.A-43; Dhanagare, 2016, p.142).

Meanwhile on the domestic front, in line with the newly enacted global commitments and to pursue its ambitions of being wholly integrated into global financial and economic systems, the finance committee set-up in 1991 also known as the Narasimham Committee 1991 recommended the withdrawal of "credit system for redistributive objectives" (Mihir Shah, Rangu Rao and P. S. Vijay Shankar, 2007, p.1356). Consequently, the withdrawal of commercial banks from the rural areas led to a burst of microfinance institutions complimented by the Self-Help Group programmes to fill the void. Between 1992 and 2018, the microfinance-SHG linkage programme expanded its coverage from 500 SHGs to 10 million SHGs whose savings are linked with banks (NABARD, 2019).

In 2001, the government introduced a norm for priority sector lending (PSL) for agriculture under which all commercial banks were expected to allot about 40 percent of credit toward agriculture. In addition, the Kisan Credit Card (KCC) Scheme was introduced by the government and implemented by NABARD to help farmers purchase seeds, fertilisers and other agricultural inputs using the KCCs. It is also important to note here the humongous rise in the uptake of KCC in Maharashtra from 0.8 million in 1998-99 to 5.1 million in 1999-2000 and 8.6 million in 2000-01. This is also because the government linked crop loan from

banks to the KCC. Interestingly, according to Sajane *et al.* (2011, p.174), more than 70 percent of the borrowings for crop loans in the districts surveyed came for irrigated landholdings.

To summarise, the regional rural banks (RRBs), along with the Primary Agricultural Credit Societies (PACS) and the cooperative banks, the microfinance-SHG programmes and the commercial banks form the institutional landscape for extending credit to agrarian households in rural India. The informal credit network consists of moneylenders, traders, landowners and familial relations. Together with the multiple mechanisms of extending credit such as through direct loans, short-term and long-term credit and through the KCCs, with and without collateral based on the type of loan can be understood as the financial landscape of credit-debt provision in rural India.

Simultaneously, in agreement with the structural adjustments recommended by the IMF, India slashed its expenditure on rural development programmes which lead to sharp rise in rural poverty, exacerbated landlessness and social differentiation among the rural households. This period also witnessed a major shift in cropping patterns from food grains to export crops (Patnaik, 2003, pp.48-50; Mohanty and Lenka, 2016, pp.170-81). With liberalised trade policies, this resulted in decline in per capita availability of food grains, lowered nutritional intake, along with unsold public stock of food in addition to import of cheap food grains (Patnaik, 2016, pp.128-9).

In 2020, in tandem with its objectives to further privatise agriculture and withdraw all forms of state support to agriculture, the Government of India passed three ordinances - the Farmers' Produce Trade and Commerce (Promotion and Facilitation) Ordinance, 2020, the Farmers (Empowerment and Protection) Agreement on Price Assurance and Farm Services Ordinance, 2020, and the Essential Commodities (Amendment) Ordinance, 2020and Farm Services Ordinance, 2020, and the Essential Commodities (Amendment) Ordinance, 2020.

This chapter lays out the policy landscape to pinpoint the role of the state in implementing policy decisions towards adopting a credit-based planned growth approach. This mainly brought about inherently unequal financial deepening for a select few classes, castes and genders. The processes transformed individual agency, institutions, economic and social structures with consequent environmental ramifications which are identified in the upcoming three chapters.

Chapter 4
Debt Induced Dispossession: Cases of Parched Fields and Lost Lands

In the long-standing debates around India's agrarian transformation, class differentiation and class formation have emerged as markers of dispossession through commercialisation of agriculture, increased market dependence, infusion of credit and intensified nature of production. These debates on the mode of production, primitive accumulation, dispossession and consequent social differentiation help contextualise contemporary analysis on the changing nature of agriculture in India (Jairus Banaji, 2002; Mohanty, 2016). They also correspond to Sassen's reconceptualization of the logic of extraction of value, one which goes beyond the conventional understanding of extraction (Bunker, 1984, p.1019; Burchardt and Dietz, 2014, pp.469-70; Ye et al., 2020, pp.156-7) to reconditioning of institutions through complex webs of globally knotted credit-debt relations that bring about deep rooted shifts in the functioning of economic systems, social structures and geographies (Sassen, 2010, p.27). Such intricate financialization of systems is not merely exploitive, but forces dispossession by expulsion of people and environmental degradation.

This chapter is steered towards weaving together the narrative around dispossession through credit and debt relations, the predatory nature of the process of value extraction through such relations and its gendered impacts (Araghi, 2009; Sassen, 2017). The chapter offers a piece of the classical and contemporary debates around India's agrarian transformation with the objective to bind the discussions around dispossession and its ecological ramifications through India's banking systems and unruly groundwater extraction.

4.1 Dispossession and Differentiation in India's Agrarian Transitions

Akram-Lodhi's (2019) succinct summary of Utsa Patnaik's *Peasant Class Differentiation: A Study in Method with Reference to Haryana* provides an overview of the debate to root the current agrarian crisis in the liberalisation of the Indian economy in 1991. In the neoliberal reform period, agricultural land came to be acquired for industrialisation and urbanisation through mechanisms of tax concessions and economic enclosures favouring agri-businesses and corporates, causing dispossession of land and other natural resources among farmers (Mohanty, 2016, p.20-1). Further, restructuring of economic institutions, changes in land size and ownership patterns, rise in wage labour employment, influx of credit finance in rural India which contributed to the commodification and financialisaton of agriculture are elaborated by Basole and Basu (2011).

While credit-debt relations are recognised as a critical factor in analysing the transformation of India's agrarian relations, its ecological and gendered impacts remain excluded from the classical debates (Bhaduri, 1981; J. Banaji, 2002; Mohanty, 2016). Bina Agarwal succinctly describes India's agrarian transition to be "slow, uneven and highly gendered" (Agarwal, 2003, p.191). This would also mean gendered consequences from the dichotomy of credit-debt relations (Padhi, 2009; Panditrao Ghunnar and Bhatt Hakhu, 2018). Indebtedness influences women's role as primary agents for sustenance of the household and this directly relates to women's knowledge and decisions about the landscape (Rocheleau, Thomas-Slayter and Wangari, 1996).

Data from the National Sample Survey Office's (NSSO) 70th round and analysed by Yadu and Satheesha (2016) offer insights into the extent of indebtedness among India's rural households, fragmentation of land holdings and shift in livelihood dependence. In conjunction with Basole and Basu (2011), Kandikuppa (2018) and the GoI's Periodic Labour Force Survey Report and the Agricultural Census (GoI, 2018a, 2019), the data provides a useful narrative to study the role of credit-debt relations in India's agro-ecological crisis.

In 2011, India recorded 9 million fewer cultivators and a steep rise of nearly 40 million more agricultural workers than in 2001 (Census, 2011a, 2001). Between 2002-03 and 2012-13, there has been a 6 percent increase from 60.1 percent to 66.1 percent in 'effectively landless[2]" households in rural India (Yadu and B, 2016, p.21). Further, between 1992 and 2013, the debt to asset ratio for a farming household increased by 630 percent with more than 52 percent of the agricultural households[3] indebted (Kandikuppa, 2018; Press Information Bureau, 2019). This form of social differentiation from cultivators to agricultural workers and the rise in the number of effectively landless indicates changes in not merely ownership of land and dispossession of assets but also the relationship of the grower with the land. Corroborated by literature and validated in interviews across six states and eight agroecological zones (Appendix A and B), indebtedness among agricultural households was recognised as a critical factor which exacerbates dispossession (Gerber, 2014, pp.732-5).

According to Amol Waghale, member of All India Kisan Sabha (AIKS), a farmer's union affiliated with the Communist Party of India, dispossession should be understood not merely in terms of loss of land, but also in terms of assets such as livestock, agricultural instruments, tractors, two-wheelers and specifically gold owned by women, thus leading to "geographies of expulsion" (Sassen, 2017; Singh *et al.*, 2017, p.52). This occurred in alliance with a shift in cropping patterns toward non-food crops, a sharp rise in private tubewells and privatisation of agricultural inputs such as seeds and fertilisers (Waghale, 2020).

In telephonic interviews, representatives of the Agha Khan Foundation (AKF) and Samaj Pragati Sahyog (SPS), attributed privatisation and deregulation of agricultural inputs in the Green Revolution and the post-Green Revolution period for the increase in indebtedness among agrarian households and for land degradation.

> "With the Green Revolution, there was a shift in cropping pattern, an increased dependence on fertilizers and pesticides and emphasis on purchase of HYV of seeds for better output. Overtime this shift inched toward monocropping systems of cultivation and with an increased cost of these inputs, farmers were forced to take on loans. Debt has now become a way of life" (Animesh, 2020)

> "With increased dependence of chemical fertilisers, not only has the input costs shot up, but the biomass availability in the soil has lowered. There is loss of fertility. Further, with lowered levels of groundwater, farmers have to take on loans for purchasing heavy machinery to extract water" (Patidar, 2020)

a. The assemblages of Green Revolution - institutional credit and high yielding and water guzzling varieties of rice and wheat were directed at 'creditworthy' rich farmers (Ramachandran and Swaminathan, 2002, p.504). This is also an indicator of how credit relations are "powerful mechanisms of social selection" (Gerber, 2013, p.840). While a large

[2] "If landlessness is understood as pertaining to land that can be used for cultivation and that can generate some income for the family, then a more realistic definition must consider all households owning less than 1 acre [0.40 ha] as 'effectively land less'." (Basole and Basu, 2011, p.44)

[3] An agricultural household, as per the 70th round of the survey on the situation of agricultural households in India, is "a household receiving value of produce, more than INR 3000 (USD 43) from agricultural and having at least one member self-employed in agriculture either in the principal status or in subsidiary status during last 365 days" (Press Information Bureau, 2019).

section of the small and marginal farmers and landless were eluded from such benefits, however, were impacted since they were unable to compete with the large farms and continued to rely on moneylenders to meet their credit needs. These are well-known to the borrowers and dawn multiple hats such as that of landlords, local traders, labour contractors or agents and or a rich farmer (Brass, 1999, p.11). These moneylenders are also agents for seeds and fertilisers of global agro-companies such as Cardill, Syngenta and Bayer. The debt then is not merely pecuniary but also in kind. To repay the debt, farmers are forced to sell their produce to the same agent who sold them the required inputs in the beginning of the sowing season. Often, the sale of the produce is not enough to meet the debt, reinforcing the debt trap and dispossession becomes a means to escape the trap (Patidar, 2020). When rooted in agriculture, credit-debt relations are not merely "economic in nature" (Bhaduri, 1986, pp.267) but encompass broader class, caste and gender dynamics which trap the debtor in a relation of oppression with the creditor. Debt servicing takes the form of economic compulsions and "non-economic coercion" (Bhaduri, 1986, pp.267-9; Guérin, 2013, p.4; Taylor and Bhasme, 2019, p.4) through disciplining and conditioning.

On the other side, in an interview with Rajeev Baruah, an expert on organic cotton cultivation, explained how environmental degradation increased indebtedness among the Indian cotton growers. "It's a trap," says Rajeev (Baruah, 2012). According to Rajeev, increased dependence on fertilisers and pesticides for improved cotton yields forced farmers to borrow to meet the rising costs of such inputs. The cycle of degradation from use of pesticides and fertilisers, followed by specialised and sophisticated fertiliser requirements to reverse degradation and then additional credit to meet the higher input costs continues unabated (Baruah, 2020). Infusion of corporatized seeds and fertilisers for better yields not only caused a loss of seed sovereignty but also from diverse crop to homogeneous crop varieties and monoculture plantations. This caused environmental degradation from high salinity levels resulting from pesticide usage. Further, the shift away from community means of seed sharing and conservation also dispossessed the farmer from traditional knowledge systems about seeds and types of fertilisers to protect the crops (Animesh, 2020). The increased market dependence for agricultural inputs ignited the wheels of an inescapable cycle of debt and degradation which became hard to escape. This also further reinforces that debt servicing functions within the larger assemblages of factors that creates the conditions for expulsions and function as "regimes of discipline" (Sassen, 2010, p.85) since it prioritises the payment of debt forcing decisions which are profit-oriented and may not be environmentally conducive.

4.2 A Banker's Lens to Credit-Based 'Development'

NABARD, one of the world's largest rural development banks was set-up in 1982 to provide focus on rural and agricultural development through injection of credit and to address issues related to credit access in rural India. NABARD has been appointed as the sole disburser of several credit-based development programmes of the Government of India (GoI) such as the Long-Term Irrigation Fund, Micro Irrigation Fund, the Self Help Group (SHG) Bank Linkage Project, Tribal Development Fund, Watershed Development Fund and the Kisan Credit Card Schemes. It is also recognised as an apex institution to monitor and coordinate the functioning of rural banking policies, programs and institutions such as the Regional Rural Banks (RRBs), Cooperative Banks and Primary Agricultural Credit Societies (PACs).

NABARD functions through a network of more than 5000 civil society organisations, financial institutions, state governments and district administrations. The bank does not engage in direct customer facing services. However, a majority of its portfolio rests on extending credit services to developmental projects in India through its network.

In an interview with a Bank Officer of NABARD, I was informed that the GoI has a special preference to make credit available for all forms of irrigation projects to state governments. This is because irrigation is recognised as a critical factor for improving cropping intensity and as a prerequisite for adopting high yielding varieties of crops (Sidhu, 2002, pp.3133-5; Sarkar and Das, 2014, p.67). He emphasised that for developing countries such as India, "Credit is a mechanism for growth and without expansion of credit, agricultural growth cannot be achieved. Therefore, subsidy or grant-based projects are a burden on the balance sheet as compared to credit-based projects" (Bank Officer at NABARD, 2020).

Understandably Punjab was one of the leading states to adopt the assemblages of 'Green Revolution' primarily because the net irrigated area in the state in 1965-66 was about 60 percent when the national average was 21 percent (Rana, 2017, p.58; GoI, 2018, p.71). This made farmers of Punjab with large landholdings and irrigation facilities, creditworthy to borrow for expanding agricultural production. Notably, with easy access to credit, the period of the Green Revolution also witnessed an increment in the net irrigated area under tubewells from 258,000 hectares in 1961-62 to 2,112,000 hectares in 1967-8 with Punjab having the highest ratio of private tubewells to geographic area in India by 1977 (B. D. Dhawan, 1979, A-145). As a result, Punjab is reeling under a groundwater crisis and deteriorated land conditions from use of fertilisers and capital-intensive technologies which has imposed indebtedness on the agrarian households (Padhi, 2009, p.53).

The average debt per cultivator household in Punjab stands at INR 216,524 (USD 2954.16) in 2014-15 as compared to INR 7,125 (USD 97.21) in 1991-92 (NSSO, 1998, p.41; 2014, p.A2). The availability of credit to invest in technology also displaced local labourers from Punjab forcing migration from agriculture to non-agricultural occupations, thus creating conditions for 'expulsion.' Additionally, the debt and the groundwater crisis had a gendered impact on the women of the household. Literature on the agrarian crisis in Punjab also acknowledges acute differentiation from cultivator households to agricultural labourers with the small and marginal farmers forced to sell their land and other assets to pay off debts (Padhi, 2009, p.54; Singh and Bhogal, 2020, pp.22-24). The unremunerative nature of agriculture further impoverishes households when they are forced to take on a debt for meeting social obligations such as dowry for weddings of their daughters. The income earned from wage labour is so meagre that it becomes impossible to pay off debts incurred. For farm widows, the debt then becomes a double-edged catastrophe. A detailed study by Ranjana Padhi (2009) discusses the impact of debt induced agrarian distress on farm widows in Punjab. They not only have to navigate complex societal norms to work as labourers or farmers to payback debt but are also expected to contribute to the social reproduction of the household.

> "I have nothing left. I even sold off the gas cylinder for money." (Padhi, 2009, p.55)

> "Meeting the wedding expenses of a son is also impossible without getting into debt or selling assets. She had to sell two buffaloes at INR 45,000 to get her son married." (Padhi, 2009, p.56)

> "Having no land left is the biggest humiliation the family of Parminder Kaur is facing within the village and the community in Sangrur district." (Padhi, 2009, p.56)

Despite recognising the socio-ecological impact of debt induced chemical agriculture in the case of Punjab, the bank officer said that extending loans and credit facilities to crops such as paddy and wheat, specifically in the states of Punjab which are not native to paddy cultivation, was now a prerogative to meet the food security requirements of the country. "During Green Revolution, Punjab farmers were given a larger role to feed the country, we did it and now they must stand by us," (Jagga, 2020, no page number) a farmer quoted by a national daily newspaper at the protests against the farm ordinances.

Under the National Food Security Act, 65 percent of the households or around 800 million people in India are legally assured a right to food at subsidised rates from the Public Distribution Systems (PDS) and through welfare programmes such as the Integrated Child Development Services and the Mid-Day Meal Scheme (GoI, 2013). To meet this requirement, the procurement of food crop is coordinated by the Food Corporation of India (FCI), legally mandated for maintaining a central pool of buffer stock and for procuring, storage, transportation and maintenance of food stocks in the country. However, this procurement is policy is heavily tilted towards rice and wheat. In 2019-20, the FCI procured 357.95 lakh million tonnes (MT) of wheat and 443.99 lakh MT of paddy with Punjab contributing 28 percent and 21.5 percent respectively to the central pool (FCI, 2020b, 2020a).

In comparison, the central government approved a procurement of 3,49,250 MT of coarse grains or nutri-cereals which are jowar, bajra, ragi, maize and barley by state governments for the central pool and to be locally distributed. Notably, the area under the cultivation of coarse grains was reduced by 20 percent between 1966-67 and 2017-18 when compared to rice and wheat whose area increased by nearly 20 percent and 56 percent respectively. However, it is important to point out that the increase in the yield per hectare of millets is comparable to rice and wheat at 73 percent, 74 percent and 66 percent in the same period. More importantly, as informed by interviewees from SPS and AKF, (Abhinesh, 2020; Patidar, 2020), millets are not only more nutritious when compared to wheat and rice, they grow in semi-arid conditions without burdening groundwater tables, require minimum inputs and provide a diversified food basket to the household and community.

"Resource insensitive government policies," (Sharma, 2020) summarising the groundwater crisis and debt-burden for small and marginal farmers in India, Ramesh Sharma, the national convenor of Ekta Parishad, a social movement for securing justice for the landless, small and marginal farmers in India said to me. This also indicates that procurement policy of the state is closely entangled with production. Dr. Richa Sharma, a social scientist and author of the book, 'Rethinking Revolutions: Soybean, Choupals, and the Changing Countryside in Central India,' said to me that the agro-ecological cost of the relationship between the triad of MSP, credit and the subsidy regime must be looked into. Specifically, in the case of monoculture cropping of wheat, sugar and rice, the state systematically supported crops of high-water intensity which led to increased investment through credit-based facilities for such crops (Kumar, 2020).

A link between credit for irrigation-groundwater and dispossession is evident and yet undertheorized. Tubewells have played a critical role in escalating the crisis and the use of credit to dig tubewells to make up for water scarcity or to support water intensive crop cultivation is now become a political necessity. However, access to water resources are not homogenous geographies. Taylor labels the intersection of complex socio-economic hierarchies and culture with differentiated access to water and interweaves it with the problem of indebtedness to call such landscapes as "debtscapes" (Taylor, 2013, p.691). Access to a water resource and the type of water resource becomes a critical variable for not only deciding crop type and for improving the productivity of the output, but for securing sufficient income to repay the debt incurred. There is a cyclical relationship between access to institutional credit, improved irrigation, and higher yields. However, a drought year may plunge the household back into a cycle of indebtedness, unable to payback its previously incurred debt and shifting its reliance on debt from its informal network.

According to the Bank Officer from NABARD, debt must be looked at from the lens of vulnerability (Bank Officer at NABARD, 2020). The poorer you are, the higher your vulnerability to debt and this is inherently connected to agro-ecological zones. Agrarian households engaged in dryland farming are more vulnerable as compared to those in irrigated areas. But the latter are also preferred as creditworthy, a form of 'social selection' in credit-debt

relations (Gerber, 2014, pp.742-3). From interviews and data assessed, it is evident that those engaged in irrigated agriculture, are high caste households with large landholdings and better positioned to borrow from institutional sources yet are prone to be indebted. To payback debts, such farmers make investments in capital intensive technologies and certain crops with assured markets to reduce their vulnerability to debt despite the ecological unsuitability. However, much of the debt incurred is also directed towards social and cultural purposes such as weddings, purchase of vehicles and refurbishing of the house and other such expenses. For small and marginal farmers, such debt compounded with the increased cost of agricultural inputs puts them at a higher risk as compared to the farmers with large landholdings. Besides, until the farmer pays back the debt borrowed from a bank, they become ineligible to receive additional credit and thus fall back on the local moneylenders. Further, a banker visiting a household to recover a loan is looked upon as a social embarrassment on the household and is therefore avoided at all cost. This again hints at a mechanism of disciplining which also forces the household to sell its assets, including gold and its land, to payback the debt to avoid altercations with bank officers (Gerber, 2013, p.853). Thus, according to a representative of the Ekta Parishad, the mechanism of acquiring credit from the informal network through a *seth* or *sahukar* which is the moneylenders, maybe exploitive in nature but is more humane when compared to the formal banking sources of credit in terms of arrangements of return and flexibility in the case of non-payment resulting from a poor harvest or climatic conditions (Sharma, 2020). These are also social relations of exchange. According to Sassen then, it is critical to see banking policies and programs as "disciplining regimes" (Sassen, 2013, p.41) and not merely transactions.

Akram-Lodhi interpreted neoliberal globalisation as a form of enclosures resulting from agrarian transformations that have changed the "processes of rural production through market-led appropriation of land under conditions regulated by the dominant classes" (Akram-Lodhi, 2007, pp.1446-7). This interpretation fits well to understand the nexus of dispossession, debt and ecological degradation in the Indian context. These expulsions which take the form of dispossession, differentiation and displacement are predatory in nature and function through extraction from land and water resources induced by credit-debt relations (Sassen, 2014, p.29). However, these impacts are not homogenous, but biopolitical, as discussed in the next chapter.

Chapter 5
A Debt of Her Own: On the Biopolitics of Debt and Agricultural Vulnerabilities

The All-India Debt and Investment Survey (AIDIS) indicates that the Incident of Indebtedness (IOI) or the percentage of indebted households was higher among Scheduled Castes (SCs) and Other Backward Classes (OBCs)[4] as compared to the other social groups and the proportion of credit advanced by non-institutional sources in rural India was higher as compared to institutional sources (GoI, 2014, p.17-19). However, gender disaggregated data on indebtedness remains excluded from the national survey. This data gap is concerning since 73 percent of the female workers as compared to 55 percent of the male workers are engaged in agriculture in rural India (GoI, 2019, p.iii). Despite their greater involvement, only 13 percent women with land titles are classified as farmers while the rest are labelled cultivators or agricultural labourers (Raman, 2019). India's Economic Survey for 2018-19 stated a "feminisation of the agricultural sector" (Press Information Bureau, 2018). The influx of men from rural to urban areas as contract labourers has led to an increased participation of women on the farm, according to the report. However, women's labour has remained invisible to the household, community, political and legal systems for decades, and so is her debt.

Further, the processes of agrarian transformation and environmental change are embodied and are a critical site for analysing "larger socio-cultural and political-economic relations structuring agri-food systems" (Kinkaid, 2019, p.47). When debt servicing becomes a priority, the impact of credit-debt relations is not simply a matter of in-kind and pecuniary exchanges, but also transform individual agency, health, and well-being. Thus, debt servicing becomes a biopolitical process by exploitation of labour and embodied experiences of such forms of exploitation (García-Lamarca and Kaika, 2016, pp.313-4) which are often gendered in nature.

At the same time, debt has enabled women to undertake economic activities inaccessible to them previously due to household patriarchal norms, financially contribute to household reproduction and find their voice in financial decision-making of the household. Using the feminist political ecology approach, this chapter evaluates the duality of credit-debt relations as exploitive and empowering. For this purpose, I rely on Bina Agarwal's pioneering work on recognition of women's legal rights to agricultural land. This has brought to the forefront issues on gender disparities and uneven power dynamics within households on resource allocation, distribution and recognition of agricultural labour, and the gendered impact of ecological degradation (Agarwal, 1992, 1994, 2016). I also rely on Kinkaid's (2019) understanding of embodying impacts of agrarian change and García-Lamarca and Kaika's (2016) conceptualisation on the biopolitics of debt. Finally, embedding these themes with Sassens's 'geographies of expulsion.'

5.1 The Biopolitics in the 'Feminisation of Debt'

Here, I apply Bieri's adapted definition of feminisation where the author identifies the social process to be one where, "first, women compared to men have a higher incidence of a given item; second, that the incidence of this item is increasing for women; and third, that women's

[4] Refer to the glossary.

experience is more marked than men's" (Bieri, 2014, p.282). To counter patriarchal dominance and abuse, deep-rooted institutional biases and marginalisation by the state, women farming collectives and self-help groups (SHGs) have emerged as alternate strategies for empowerment contributing to the trend of 'feminisation of debt.' Credit was considered a critical mechanism for livelihood generation for women, positively impacting nutrition, education and decision-making status in the household. Through the SHGs, banks were more forthcoming to lend to the group, backed by institutions such as NABARD and other civil society organisations and in the past few years to women collective farming initiatives. (Mihir Shah, Rangu Rao and P. S. Vijay Shankar, 2007, pp.1358-9; Garikipati, 2012, p.2). While such initiatives call for pooling of lands, technology, labour and equal distribution of benefits, they are known to reinforce social hierarchies of class, caste and gender biases (Guérin, D'Espallier and Venkatasubramanian, 2013; Garikipati *et al.*, 2017, p.14).

A contradictory phenomenon of 'feminisation of debt' emerges from the embodiment of debt induced 'voluntary' free labour in the form of exploitive cycles of "debt servicing labour obligations" through debt disciplining (Brass, 1999, p.12). In the period of the Green Revolution, labour demand was met by transporting labour from the states of Uttar Pradesh and Bihar, mainly from the tribal areas to the Jat Sikh farming households of Punjab, a high caste and class sect of northern India. This demand emerged from increased production, a consequence of improved irrigation facilities and Green Revolution assemblages received from the state (Sidhu, 2002, pp.3132-3) and to counter higher wages demanded from local labour. If what matters is "the larger assemblage of elements within which debt functions and which the dynamics of debt helped constitute" (Sassen, 2014, p.85), we need to pay specific attention to the mechanisms through which labour was employed for fuelling this debt induced agriculture growth. The most prominent feature of this pre and post green revolution labour attachments is the practice of "interest free cash advances" (Brass, 1999, pp.81-5). These cash advances forced migrated labourer to offer their services to the same contractor as a means of debt repayment, often taking the form of long-term labour attachments (Brass, 1999, pp.223-5). The debt requirement for an agrarian household fluctuates between peak and off-peak agricultural season, and the debtor is forced to work for the creditor until he pays off the debt, also enforced through *gram panchayats*[5] (Brass, 1999, p.124). In the case of burgeoning debt, members of the family migrate for better income opportunities which also takes the form of debt bondage. With the increasing social differentiation from cultivator to agricultural worker and then to landless labourer, debt-bondage is becoming a dominant feature of rural distress. The concept of dispossession from debt then must not be assessed as sacrosanct loss of material assets, but also as loss of human dignity, indigenous knowledge systems and ancestral relations to land.

Further, the intensification of agriculture in Uttar Pradesh and Bihar either led to small and marginal farmers borrowing for sustenance and losing their land on account of unpaid debt, or a sharecropper bearing such high proportions of debt that he would abscond to Punjab for better wages, leaving women to bear the brunt of the moneylenders. This cycle of debt exacerbated poverty of the household with gendered differentiated impacts. Women then not only performed unwaged familial functions of providing for care and nourishment, but also contributed a larger portion of their wage earnings towards the household's sustenance (Agarwal, 2016, p.217). Further, when an indebted household is unable to repay a debt, it imposes another round of credit borrowing on the household, albeit from a different credit source and often for social reproduction of the household and not for cultivation purposes (Singh et al., 2017).

[5] Refer to the glossary.

However, women's agency as farmers on family farms and as landless cultivators, labourers and migrant contract workers remains subordinated to the male members of the household and workforce. They face unfavourable conditions when searching for employment, are disadvantaged by their restricted mobility and an inherent bias against providing them with entitlements, equal wages and longer duration contracts on account of their gender identity (Agarwal, 2016, pp.214-17).

The impact of such debt bondages is also gendered for women labourers who are forced to work in place of absconding male members, often wages are held back and the women are also subjected to physical and sexual violence, as confirmed by Seema Kulkarni, National Convenor of the Mahila Kisaan Adhikar Manch (MAKAAM) (Kulkarni, 2020). This is particularly significant since India recorded 9 million fewer cultivators and a steep rise of nearly 40 million more agricultural workers between 2001 and 2011. A gendered disaggregation of the data indicates 10 million more female and 20 million more male agricultural workers in the same period. However, in 2011, India had 14 percent fewer female cultivators as compared to 3 percent fewer male cultivators. Interestingly, while the male agricultural workers and cultivators are almost equal, the number of female agricultural workers to cultivators has doubled (Census, 2001 and Census 2011a).

The decision-making of an indebted household is influenced by environmental change while also impacts the ecological landscape (Harcourt and Nelson, 2015). Importantly, there are interlinkages between women's access to and rights on resources and class-gender parameters on time, income, health, socio-survival networks, indigenous knowledge and nutrition as elaborated by Bina Agarwal (1992). A detailed study carried out by the MAKAAM on debt-bondage among the women sugarcane labourers in the state of Maharashtra lays bare the atrocities endured by women from debt-bondages (SOPPECOM, 2020). Hired as a husband-wife pair through advance credit arrangements for performing strenuous tasks on the fields, the women are subjected to bodily violence through poor sanitation facilities, sexual harassment and hysterectomy to provide their labour services to pay off the debt. While the practice of migration of agricultural labour to the sugarcane fields is a few decades old, increased frequency of droughts across Maharashtra and repeated crop failures have forced labourers to undertake debt linked bondages to sugarcane cultivation. A majority of the agricultural labourers belong to the small and marginal agricultural households mainly in the rainfed areas in Maharashtra or are landless and belong to the SCs or the nomadic communities. Advance credit, urgency to repay past debt, landlessness and collapse of the government's rural employment guarantee programme (MGNREGA) and lack of options to find work locally are primary reasons for their dependence on income from working as labourers in sugarcane fields. (SOPPECOM, 2020, pp.4-5). Women are often forced to undergo hysterectomy to ensure uninterrupted work cycles to repay debts, the costs of which are borne by the contractors and repaid through deductions from their daily wages. They often work until the final stages of pregnancy under deplorable conditions. Their work hours are erratic and range from 13-18 hours a day, with no maternity or social security, healthcare and childcare benefits. These embodied experiences of exploitation are biopolitical processes induced by debt, promoted by the state and embedded in ecological landscapes.

Over the past six decades, the acreage under sugarcane has increased by 571 percent while those under millets such as jowar and bajra has declined by 72 percent and 32 percent respectively. In fact, despite successive droughts experienced in the state between 2016 and 2018, sugarcane cultivation increased by over 10 percent, while area under food crops declined by over 12 percent (Government of Maharashtra, 2020, pp.3-4). Now well recognised as a water guzzling crop, sugarcane is prioritised by the state for its ethanol extraction to serve the vested interests of certain upper caste and class groups while leaving labourers not only displaced from their landscapes, deprived of nutrition, social security and healthcare but

also heavily indebted. This functions through the 'extractivist logic' deeply embedded in the dynamics of capitalism to concentrate land resources for the benefit of a few while creating 'geographies of expulsion' for the socio-economically disadvantaged groups.

5.2 Collectivising Debt Uptake Through SHGs and Group Farming

In this section, I draw on the analysis by Bina Agarwal (Agarwal, 2018; 2019) on group farming initiatives in the state of Telangana and Kerala in India for insights into the role of collectives as a means of security, safety, resistance, sustenance and food sovereignty among women and its ecological impacts. I interviewed (Sreerekha) S Mullassery Sathiamma, Associate Professor at the International Institute of Social Studies for a perspective on Kudumbashree, a three-tier community network model for poverty alleviation and empowerment in the state of Kerala. While Kudumbashree functions through several nodes of community development, for the purpose of this thesis, I will only look at the model of collective farming groups for credit access. I also interviewed Rahul Joshi, representative of the civil society organisation Srijan which promotes the Maitree Mahila Mandal (MMM), a women's self-help group federation in the Tonk district of Rajasthan.

The proliferation of women's self-help groups led to the flow of formal institutional credit to women. Women were also considered to be more trustworthy in loan repayments. But also, culturally, women did not have any associations with banking institutions and therefore, were cautious and vulnerable as these were uncharted geographies for them. Their inexperience with the banking sector, many of them would have never borrowed or engaged in formal monetary transactions before, also makes them easy targets (Mullassery Sathiamma, 2020). According to Garikapati (2012, p.4), and confirmed in the interview, since women are also not legally recognised co-owners of agricultural lands due to patriarchal systems of inheritance, finding self-employment through the SHGs is remunerative and helps diversify the livelihood of the household (Mullassery Sathiamma, 2020).

Both interviewees outlined access to credit and an opportunity to organise into groups as enabling variables to improve women's bargaining power in the household. In both cases, women were now consulted as part of the financial decision-making of the household primarily because they could access loans at much lower rates as compared to what the men would receive from moneylenders or bankers. However, decisions related to land resources were dictated by the patriarchs of the household, unless these were collective farming initiatives such as the Kudumbashree.

In Rajasthan, the model adopted by MMM enabled credit facilities either for agricultural or entrepreneurial activities with no collateral requirements to women. This makes the programme attractive to several agricultural households that are burdened by debt and are at the mercy of the local moneylenders. The debt incurred is a fallout of the agrarian crisis brewing in India's rural hinterland discussed in earlier sections, and specifically related to high input costs, low revenue streams from agriculture, and rising consumption expenditure. Sometimes, households may have lost lands to moneylenders and may have to engage as wage-labourers. In this case, the SHGs are a remunerative reliable mechanism for such households (Joshi, 2020). In the case of Kerala, women step outside their protective patriarchal set-up of the household out of desperation to mainly accumulate money for their daughter's dowry (Mullassery Sathiamma, 2020) and to break away from family farms which provide women autonomy to decide on crops, technology, and distribution of profits (Agarwal, 2018, 2019).

While land leasing has been a herculean task for the collectives, women collectives are taking over unused lands for subsistence farming, forcing authorities to consider joint group ownership titles, a provision not available in federal laws in India (Chandra, 2018). However, women farming collectives choose to grow food crops instead of cash crops when more than 70 percent of the agriculture in Kerala consist of cash crops. This is primarily because of the uncertainty associated with such crops in the last decade and the fluctuations in the international market in relation to these crops such as coconut and rubber. According to Sree, these are driven by economical concerns than environmental considerations. However, she is also quick to point that despite their participation as part of SHGs and the farming collectives, women continue to be burdened with social reproduction responsibilities of the household. Additionally, women may be used to access cheaper credit to make investments in farms but may not always have a say in making decisions related to farm activities.

> "The experiences of these women indicate that they retained little influence over the assets and incomes created from their loans. Before obtaining loans, some of these women worked on family farms or within their households, but now find themselves working as wage laborers mainly to meet repayments." (Garikipati, 2012, p.12)

Paying off debt, then becomes an obligation to continue to remain members of such SHGs despite tyrant terms of contract. Overall, debt bondage forms contribute to expulsions which are only partially quantifiable and largely invisible which have occurred in micro-settings influenced by larger dynamics of our political ecologies (Sassen, 2014, p.30). While credit provides a sense of liberation from patriarchal dominance and a voice in decision-making at the household level, there are two ways in which the 'feminisation of debt' and its relation to the land must be assessed. First, through environmental degradation that forces women to seek for employment opportunities outside of its land, either because the families have lost lands in a mortgage and the SHG then offers a refuge to enable women to financially support the household. Second, through collective farming initiatives, women are able to influence decisions related to land resources at the community and the household level, albeit partially in the latter case.

The next chapter discusses how debt and environmental degradation are interlinked through the financialisation of agro-commodities. It explores the case of soya, a 'flex' crop and the socio-economic and ecological dynamics of such an internationally traded commodity.

Chapter 6
Ecological Repercussions from Indebted Agro-Commodity Value Chains: The Case of Soya

Post-colonial India saw a trend toward expanding area under cultivation, acreage under irrigation and improving access to credit facilities as part of the assemblages of the 'Grow More Food Scheme,' until augmenting the Green Revolution. Making credit and extension facilities available to farmers was the "backbone" (GoI, 1976, p.11) of the approach adopted for agricultural planning in India. In the period of the Green Revolution, this strategy was supplemented by regulating rural banking for prioritising agricultural credit. However, this was "biased in respect of regions, crops and classes" (Ramachandran and Swaminathan, 2002, p.505) and ecologically disrupting technologies such as tubewells and high yielding varieties of seeds, financed through institutions such as the World Bank and USAID (Shiva, 1991, p.261-4). In an economically liberalised India, agro-companies emerged to correct "inefficient agrarian markets" (Kumar, 2010, p.1333) and to make the country globally competitive in the export market. This transformation of India's agriculture through deregulation, privatisation and financialization only aggravated indebtedness and ecological fragility of resources.

In this chapter, I further conceptualise extractivism and its relation to credit-debt mechanisms through the history of the 'yellow revolution,'[6] specifically soybean production in the Malwa Belt in Madhya Pradesh. For this purpose, I move away from the conventional meaning of the logic of extraction and neo-extraction (Bunker, 1984; Burchardt and Dietz, 2014; Ye et al., 2020). The chapter adopts Sassen's interpretation of extraction as a means of exploitation through predatory nature of financial systems (Sassen, 2010, 2014, 2017). It connects this to the concept of transnational capital put forth by Akram-Lodhi (2007) to evaluate ecological impacts of credit-debt relations in agro-commodities.

6.1 The Story of Soya

On agricultural lands, the period of the 'Green Revolution', led to focused infiltration of credit toward inputs and marketing of high yielding varieties of paddy and wheat. Simultaneously, in the state of Madhya Pradesh, another prominent commodity, soybean or soy, was introduced to meet India's demand for edible oil. Interestingly, soybean did not feature as a potential crop mix of oil extraction in India until the 1980s which was dominated by groundnut, mustard, linseed, castor, coconut and cottonseed (Achaya, 1975; M. L. Jhala, 1984, p.A-113). India currently imports 60 percent of its edible oil requirement, a burden on the foreign exchange reserves of the country (GoI, 2020). Such a commodity is labelled as a 'flex' crop for the multiplicity of its uses and its ability to stir or sustain global price volatility (Borras *et al.*, 2016).

Since soy was introduced to Madhya Pradesh in the 1970s and was not a staple food grain, the soya cultivators depended on the market for not merely selling their produce but also for inputs such as seeds and fertilizers and on credit services to make the purchases for agricultural inputs. Additionally, the proportion of soy used for consumption as food is merely 5-7 percent, around 45 percent is extracted for soy oil and the 55 percent is converted to deoiled cakes (DOC) for livestock feed which is exported to Europe (Bais, 2020). This

[6] A term used to refer to expand production of oilseeds alongside the green revolution to make India edible oil self-sufficient.

meant an increased market dependence on oil processing units, agro-companies and traders for buying the produce. This phenomenon then is articulately explained by Araghi as a peasant who may own the means of production but has lost the means of subsistence (Araghi, 2000, p.151) which directly co-relates to the loss of sovereignty among the agrarian communities on decisions related to what must be grown.

Soy is not a water-intensive crop and was thus suitable to the state of Madhya Pradesh with mostly a semi-arid and dry sub-humid agro-ecological zone. It also has a short cropping cycle which complimented the high uncertainty around the monsoons in the state of Madhya Pradesh. As compared to the other kharif crops, soy could be sowed with a delay of around 12-15 days and needed low maintenance. This has changed over the years with uncertain climatic conditions. The expansion of soybean production in India relates to the issue of "export-oriented capitalist sub-sector" as discussed by Akram-Lodhi (2007, pp.1448-9) with characteristics such as producing for export markets, infusion of technology and focus on improving per hectare productivity yield to reduce the per unit cost of production. This aims to make the commodity globally competitive and to improve profitability through surplus value accumulation. With a complex system of knowledge and finance which are interlinked to each other, the soybean sector makes a good example of "agro-food transnational capital" (Akram-Lodhi, 2007, p.1448).

In a series of interviews with representatives of local civil society organisations working closely with soy cultivators and with Dr. Richa Sharma, a social scientist and author of the book, 'Rethinking Revolutions: Soybean, Choupals, and the Changing Countryside in Central India,' has led to some interesting insights to the commodification and the financialization of soy in the state. With the introduction of soy, a rain-fed crop, in the 1970s in Madhya Pradesh, the *lal tur* (red lentil), a traditional winter crop was replaced with wheat. Interestingly, the farmers in the Malwa region of western Madhya Pradesh which accounts for more than 50 percent of the soya production in India would use the kharif season as the dry season for the replenishment of groundwater. The available groundwater would then be utilised for the rabi crop. With the entrenchment of soya and the advent of the green revolution, this meant a shift to not only monocropping in place of intercropping systems, but also bi-annual cropping in place of annual cropping and toward cash crops in place of food crops (Animesh, 2020). Interestingly, the area under the cultivation of soy jumped from 1.3 percent of gross cropped area in 1980-81 to over 25 percent in 2009-10. Soybean occupies over 50 percent of the cropped area in western Madhya Pradesh, mainly displacing staple food crops such as jowar (Shankar, 2005, p.5015; Jawaharlal Nehru Krishi Vishwa Vidyalaya, 2013, pp.29-30).

6.2 Boom and Bust of Agro-Companies

India has a tumultuous history of derivatives trading. Cotton was the first agro-commodity to be traded in the derivatives market in Mumbai back in 1875 (Kumar, 2010, p.63; Mohanty and Mishra, 2020, p.1). In the post-independence period, the Government of India (GoI) has intermittently banned agro-commodities trading until 2003 when three national level agro-commodity trading exchanges were set-up - National Commodity and Derivative Exchange (NCDEX), Multi Commodity Exchange (MCX) and National Multi-Commodity Exchange of India (NMCEI). Currently in India agricultural commodity futures, including soya are traded on 6 commodity exchanges.

To simply put, the derivatives market is meant to ensure price stability to the buyer and seller of a commodity by locking a price prior to the harvest by entering into a 'futures' contract. This ensures the seller an assured price for his produce and the buyer an assured product at a fixed price insulating the later and the former from future price volatility. In the case of soya, the Soyabean Processors Association (SOPA) started a derivative platform for

trading in future contracts of soybean and funded by Ruchi Soya, one of India's largest agro-companies with interests in soya oil extraction. In time, online transactions of such future trading became prominent in connivance with the local traders. The price determined in such contracts is expected to create efficient market systems for commodities since multiple actors – farmers, middle agents, traders, agro-companies and bankers with knowledge about varied factors and markets, including international markets, will be able to influence the price of the commodity. This is expected to be a win-win for all the actors involved (Kumar, 2010, 2014).

However, as explained by Dr. Kumar, the farmers and the middle agents, who form the lower rung in the hierarchy of actors involved in the global playing field of commodities such as soya, end up being "price receivers" (Kumar, 2014, p.1339) than price influencers. Since India is one of the major exporters of soybean to the global market, the price of procuring soy in the local market is linked to the process reflected on the Chicago Board of Trade and the Kuala Lumpur Commodities Exchange (more recently by the Dalian exchange in China). Further, the harvest season and the extent of harvest of soy in countries such as Brazil and USA also influence the price received by the farmers in India. The soy harvest in India takes place in October whereas the one in the US takes place in September, which means if the US gluts the market with soy, the price remains low for the Indian farmers. The Latin American harvest, though, takes place in March. However, very few Indian farmers, except for if you are a multinational corporation player such as ITC or Ruchi Soya will have the capacity to be able to hold your crop to transact post-March (Kumar, 2014, p.1339-40; 2010, p.65)

Between 2012 and 2016, the severe fluctuations in the price of soya in the global market and a glut in supply from Latin American countries eroded income for the soy farmers and agro-companies in Malwa. This also led to the shutting down of several oil extraction mills which were already running at less than half their capacity and were severely indebted. One of the largest agro-companies in Malwa, Ruchi Soya's creditors filed petitions with the National Company Law Tribunal for bankruptcy proceedings against the company for it was unable to pay its debt.

Drought years of 2014-15 and 2015-16 severely lowered the soybean procurement for extraction which dented the company's revenue. It had borrowed short-term credit to pay-back bank debts from previous years. However, its profit margins had suffered owing to international market fluctuations, government duties on oil imports and uncertainty in climatic conditions. Moreover, the price of soy was closely connected to the availability and price of palm since one could substitute the other. India imports palm oil from south-east Asia, mainly Malaysia and is not a native palm cultivator. So a fall in the price of palm oil in the international market would mean a higher demand for soy and vice-versa (Bais, 2020).

For Sassen (2014), the financialization of agricultural commodities contributes to speculative investment decisions such as land grabbing in the global south. This is similar to speculation in financial markets of non-tangible monetary commodities such as the sub-prime bubble which caused the 2008 financial crisis. However, in the agro-commodity markets, firms such as Ruchi Soya and other agro-companies undertake speculative investments to commensurate for the losses occurred as a result of poor yields in agriculture which does not always shield the big players, moreover leaves the farmers much more exposed and vulnerable.

6.3 Farmers at Crossroads

As put forth by Dr. Kumar, "While credit becomes a facilitator, market is a necessary condition" (Kumar, 2020). As credit pushes for extension of production on land, it soon spirals into a debt trap. In its initial years of inception, soy was also considered a low maintenance crop with minimal inputs and irrigation set-up. However, over the years, increasing incidents

of pest attacks has meant increased input costs in terms of fertilizers and pest-resistant varieties of seeds which has led to increased costs of production. When compared to other soy producing countries such as Argentina and Brazil, India's per unit productivity is one fourth of its counterparts. Interestingly, the respondent from Solidaridad blamed farmers for the low productivity of soy.

> "Farmers are not adopting the right practices for growing soy and are not investing enough in new varieties of seeds and fertilisers" (Motwani, 2020).

International corporate agro-business companies such as Syngenta, ABM (Advanced Biological Marketing) and Cargill extend services related to seed and fertilizer provisioning. In addition, the Soyabean Research Institute and the SOPA are bodies involving exporters, trader, agro-companies, farmers and brokers and aim to encourage the uptake of soy-based products in the market. Further, ITC set-up the e-choupal to take the mandi to the farmers. These were supermarket like structures where the farmers could sell their produce and purchase seeds and fertilisers. The payment received for the seeds and fertilisers was adjusted with the price paid for the harvest – a one stop solution for the soy farmers.

This increased dependence of chemical fertilizers and loss of seed sovereignty has pushed the farmers into indebtedness. However, Animesh informs me that the "farmers don't have to borrow for soy, but to cultivate the winter crop since the income from soy remains uncertain," (Animesh, 2020). Further, the loss of seed sovereignty is also specifically associated with loss of systems of resilience and loss of recurring value capture in seeds which means the seeds cannot be reused again. Besides, in the semi-arid agro-ecological zones in India, the cropping choices are not too many. For example, I was informed of how farmers will shift between soy and cotton based on which crop reduces risks from production. However, the local civil society organisation also informed me of a shift to maize and other lentil crops to undo the uncertainty associated with soya (Animesh, 2020; Patidar, 2020).

It is evident from the evaluation of the global trade fluctuations in the process of soy commodities that complex systems of trade, investments and value chains which Sassen describes as "assemblages of complex types of knowledge and technologies" (Sassen, 2017, p.1) are predatory in nature. They are destructive for the environment and workers, and in this case for soya cultivating farmers in India. In such an export-oriented farming system, a mono-cropping system forces a loss of bargaining power to the farmers, thus succumbing them to systems of homogenised crop cultivation and cycles of indebtedness.

Chapter 7
Conclusion

It is now evident that credit-debt relations remain a common thread through the national, community and household scales that determine spatial and social dynamics of agrarian transformations, including its ecological impacts. The credit-debt factor then becomes a critical variable to analyse agrarian transitions and environmental degradation. This study identifies the key mechanisms to explain the hypothesis of the relationship between indebtedness and environmental degradation contributing to such agrarian transitions and environmental degradation. These are dispossession, differentiation, and displacement of farmers; the biopolitical processes of debt and the socio-ecological dynamics emerging from the financialization of agro-commodities. These mechanisms were assessed through intersectional identities which analysed access to resources and resource use, patterns of land ownership, social differentiation, production and control of knowledge systems and biopolitical systems of oppression and exploitation (Rocheleau, Thomas-Slayter and Wangari, 1996, p.4-5; Gray and Dowd-Uribe, 2013, p.685; Taylor, 2013, p.693). Thereby, the relationship between debt and environmental degradation is summarised below –

b. Access to and control of natural resources, including land, commons and water resources, are often controlled by credit-debt relations engulfed in social hierarchies. This not only constrains the agency of the individual and the household based on caste, class and gender dynamics, but also exacerbates vulnerability of the marginalised and the landless (Taylor, 2013). This induces social differentiation through fragmentation and restructuring of land ownership and brings about discipling of borrowers, deterioration of community relations and the environment. It also prompts discriminatory social selection of debtors (Gerber, 2014, p. 729).

c. Debt functions through the logic of extraction which manifests through a mechanism of systemic transformation by forcing the debtor to undertake decisions which is likely to increase their vulnerability and force decisions not suitable to ecological systems. This makes such relations predatory not only in terms of socio-economic harm but also ecologically. Such relations operate through the intersectionality of identities and at multiscale with multiple impacts.

d. Improving the creditworthiness of the borrower is a critical enabler for empowering the poor. However, this becomes a disciplining mechanism for it is measured by the ability of the borrower to repay the debt incurred by whatever means. This could also be in the form of additional loans from informal sources such as local moneylenders so that the household does not have to default on loans from formal sources and they remain to be creditworthy, thus prompting the shift to ecologically unsuitable practices such as the shift to cash crops from food crops for higher remuneration. Thus, the decreasing calorific value and increase in the production of non-food crops compromises nutritional needs for households and produces ecological impacts.

e. Such ecological impacts take the form of loss of soil fertility, increased salinity from intensification through use of fertilisers and pesticides, loss of crops diversity, seed sovereignty and excessive extraction of groundwater endangering groundwater exhaustion.

f. Environmental degradation and the adoption of certain technologies and practices reduce the resilience of systems to better adapt to extreme climatic events, thus

exacerbating the vulnerabilities of the small and marginal farmers, landless and women.

g. Credit-debt relations function within the larger assemblages of factors that creates the conditions for expulsions and functions as "regimes of discipline" (Sassen, 2010, p.85) since it prioritises the payment of debt forcing decisions which are profit-oriented and may not be environmentally conducive. At the state level, this debt trap is often aided by government policies such as the minimum support price programmes, free electricity regimes and easy credit access for certain types of crops which may not be environmentally sustainable. These are also forced upon through debt programmes of the IMF, World Bank and the WTO which call for liberalisation of trade of agricultural commodities but mainly aiming at withdrawal of state support to agricultural subsidy in the global south.

h. In contemporary globalisation trends, the systems of finance have also become highly internationalised and complicated, the intricacies of which affect farmers in multiple ways. One such trend is that of derivative market future trading of agricultural crops transforming them into mere commodities. The logic of extraction goes beyond the banalities of extraction toward creating geographies of expulsion with deep rooted systemic changes. These are brought about with the oppression and exploitation through entrenchment of credit-debt relations resulting from increased commodification, corporatisation and financialization of agricultural inputs. This makes debt servicing an instrument for disciplining and conditioning systems of extraction (Sassen, 2010, p.25). This further entangles and disadvantages the vulnerable (Sassen, 2017, p.4).

The relationship between indebtedness and environmental degradation affirms Sassen's logic of systemic edges whereby "a condition takes on a format so extreme that it cannot be easily captured by the standard measures of governments and experts and becomes invisible, ungraspable" (Sassen, 2015, p.174). For this purpose, it is urgent to address issues around environmental degradation from the lens of indebtedness and vice-versa.

There are three potential pathways for future research which have emerged from the thesis. Each of these mechanisms can be independently assessed across a specific landscape to further investigate the relationship between debt and ecology with an ethnographic research process. By collating a set of additional cases from several other geographies, not limited to India, a further set of global case studies can help formulate a typology to illustrate the role of credit-debt relations in agro-ecological transformations and environmental degradation. Third, at the international scale, an investigation into transnational capital of agribusinesses and debt accrued by the global south and the consequent impact on agrarian systems in tow with policies of the WTO, IMF and the World Bank will make for an intriguing study.

The relationship between debt and ecology while under studied, remains an urgent need as we seek to understand and undo environmental degradation. Without addressing deep rooted systemic issues, environmental degradation will continue unabated ultimately impacting vulnerable local communities, endangering food security and destroying ecological systems. This research thesis was an effort toward bringing to the forefront the mechanisms through which indebtedness and ecological degradation are related to each other and for making visible the complex and integrated systems of finance which harm not merely the vulnerable but also the environment.

Appendices

Appendix A – List of Interviews

Sr. No.	Name	Affiliation	Date	Medium and Language	States Discussed
1.	Animesh Animondal	Samaj Pragati Sahyog	16 September 2020	Whats App Audio Call (Hindi)	Madhya Pradesh and Punjab
2.	Amol Waghale	All India Kisan Sabha	27 September 2020	Whats App Audio Call (Marathi)	Maharashtra
3.	Bank Officer	NABARD	10 September 2020	Whats App Audio Call (English)	India and the state of Punjab
4.	Himanshu Bais	Solidaridad	26 September 2020	Whats App Audio Call (Hindi)	Madhya Pradesh
5.	Navin Patidar	Agha Khan Foundation	25 September 2020	Whats App Audio Call (Hindi)	Madhya Pradesh and Gujarat
6.	Rahul Joshi	Maitree Mahila Mandal	28 September 2020	Whats App Audio Call (Hindi)	Rajasthan
7.	Ramesh Sharma	Ekta Parishad	9 September 2020	Whats App Audio Call (Hindi)	Madhya Pradesh and Chhattisgarh
8.	Rajeev Baruah	Independent Consultant	11 September 2020	Whats App Audio Call (English)	Madhya Pradesh, Gujarat and Maharashtra
9.	Richa Kumar	IIT Delhi	21 September 2020	Skype (English)	Madhya Pradesh (Malwa Plateau – sub-arid eco-system)
10.	Seema Kulkarni	MAKAAM	29 September 2020	Whats App Audio Call (English)	Maharashtra
11.	(Sreerekha) S Mullassery Sathiamma	International Institute of Social Studies (ISS)	12 October 2020	MS Office Teams (English)	Kerala
12.	Suresh Motwani	Solidaridad	21 September 2020	Google Hangout (Hindi)	Madhya Pradesh

Appendix B – Guidance for Semi-Structured Interviews

i. How does debt impact farmer's decisions related to land? / Does the pressure to payback the debt force farmers to take certain decisions related to the land which are not sustainable in the long run? How does impact women?

j. Could you explain to me how debt plays out for different classes of farmers – big, small and marginal and landless? How do these impact women?

k. Have you seen the farmers get more and more entangled in debt over the past two decades? What are the reasons? What are the consequences of not paying back the debt?

l. Have you seen any changes the environment and ecological changes that have impacted agriculture and is this related to debt?

m. How do you historically view the role of credit in relation to land and the environment? Has credit influenced access or decisions related to land and resources? Is this connected to certain crops?

n. Is staying financially sustainable one of the considerations for NABARD? Is that one of the criteria to adjudge the success of a project?

o. What is the modus operandi for NABARD's inflow and outflow of funds?

p. What is the role of credit for institutions such as NABARD and how is credit perceived for institutions such as NABARD?

q. Who is considered to be credit-worthy for NABARD? Are gender, caste, land and asset ownership a consideration?

r. How critical is the role of credit for sustaining a rural agrarian household today?

s. Could you help me better understand the network of rural credit facilities?

t. Is environmental sustainability a concern when lending out credit?

u. In your experience, has credit or debt come in way of making decisions that would be environmentally unsustainable?

v. Any commodity that comes to your mind when you think of the link between agro-firm, banks, and farmers? Specifically, where the land-use has been shifted to meet the needs of policies or as a result of market driven processes at the local or global level.

w. What are the available sourced of credit for farmers? Does this vary as per gender, caste and class status?

x. In your experience, has credit forced households into behaviors that may not be environmentally sustainable?

y. Do you think environmental degradation has forced agrarian households into indebtedness?

z. Could you explain to me the role of women self-help groups and microfinance in helping sustain households? Is it easier for women to acquire loans? Does it change their household dynamics?

aa. What kind of government programs and subsidies are most useful and do loan waivers work?

bb. Explain the role of credit and debt in the functioning of the soya value chain?

cc. What is the importance of credit for the agro-firms in this sector?

dd. Do agro-firms account for any environmental considerations?

ee. Why did farmers decide to cultivate soya? Are they shifting away from soya? What did they cultivate prior to cultivating soya?

ff. Has soya cultivation impacted groundwater levels or has caused land degradation?

gg. How did the international price fluctuations impact soya cultivators in India? Explain the mechanism to me?

References

Achaya, K. T. (1975) 'Tackling the Edible Oil Famine', *Economic and Political Weekly*, 10(19), pp. 758–769. Available at: http://www.jstor.org.eur.idm.oclc.org/stable/4537103 (Accessed: 19 September 2020).

Agarwal, B. (1992) 'The Gender and Environment Debate: Lessons from India', *Feminist Studies*, 18(1), p. 119. doi: 10.2307/3178217.

Agarwal, B. (1994) *A field of one's own: gender and land rights in South Asia*. Cambridge [England] ; New York, NY, USA: Cambridge University Press (Cambridge South Asian studies).

Agarwal, B. (2003) 'Gender and Land Rights Revisited: Exploring New Prospects via the State, Family and Market', *Journal of Agrarian Change*, 3(1–2), pp. 184–224. doi: 10.1111/1471-0366.00054.

Agarwal, B. (2014) 'Food sovereignty, food security and democratic choice: critical contradictions, difficult conciliations', *The Journal of Peasant Studies*, 41(6), pp. 1247–1268. doi: 10.1080/03066150.2013.876996.

Agarwal, B. (2016) *Gender challenges*. First edition. New Delhi, India: Oxford University Press.

Agarwal, B. (2018) 'Can group farms outperform individual family farms? Empirical insights from India', *World Development*, 108, pp. 57–73. doi: 10.1016/j.worlddev.2018.03.010.

Agarwal, B. (2019) 'Does group farming empower rural women? Lessons from India's experiments', *The Journal of Peasant Studies*, pp. 1–32. doi: 10.1080/03066150.2019.1628020.

Agarwal, K. (2018) *For the Third Time in Three Months, Farmers to Protest in Delhi*, *The Wire*. Available at: https://thewire.in/agriculture/third-time-three-months-farmers-protest-delhi (Accessed: 21 May 2020).

Akram-Lodhi, A. H. (2007) 'Land, Markets and Neoliberal Enclosure: An Agrarian Political Economy Perspective', *Third World Quarterly*, 28(8), pp. 1437–1456. Available at: www.jstor.org/stable/20455011 (Accessed: 18 June 2020).

Akram-Lodhi, A. H. and Kay, C. (2010) 'Surveying the agrarian question (part 1): unearthing foundations, exploring diversity', *The Journal of Peasant Studies*, 37(1), pp. 177–202. doi: 10.1080/03066150903498838.

Akram-Lodhi, H. (2019) 'Peasant class differentiation: a study in method with reference to Haryana, by Utsa Patnaik', *The Journal of Peasant Studies*, 46(7), pp. 1519–1530. doi: 10.1080/03066150.2019.1658051.

Animesh, A. (2020) 'Whats App Call to Karishma Shelar'.

Araghi, F. (2000) 'The Great Global Enclosure of Our Times: Peasants and the Agrarian Question at the End of the Twentieth Century', in Magdoff, F., Foster, J. B., and Buttel, F. H. (eds) *Hungry for profit: the agribusiness threat to farmers, food, and the environment*. New York: Monthly Review Press, pp. 145–160.

Araghi, F. (2009a) 'Accumulation by displacement: Global enclosures, food crisis, and the ecological contradictions of capitalism', *Review (Fernand Braudel Center)*, pp. 113–146.

Araghi, F. (2009b) 'The invisible hand and the visible foot: peasants, dispossession and globalization', in Akram-Lodhi, A. H. and Kay, C. (eds) *Peasants and globalization: political economy, rural transformation and the agrarian question*. London ; New York: Routledge (Routledge ISS studies in rural livelihoods, 2).

B. D. Dhawan (1979) 'Trends in Tubewell Irrigation, 1951-78', *Economic and Political Weekly*, 14(51/52), pp. A143–A154. Available at: http://www.jstor.org.eur.idm.oclc.org/stable/4368254 (Accessed: 13 October 2020).

Bais, H. (2020) 'Whats App Call to Karishma Shelar'.

Banaji, J. (1977) 'Capitalist Domination and the Small Peasantry: Deccan Districts in the Late Nineteenth Century', *Economic and Political Weekly*, 12(33/34), pp. 1375–1404. Available at: http://www.jstor.org.eur.idm.oclc.org/stable/4365853 (Accessed: 6 September 2020).

Banaji, J (2002) 'The Metamorphoses of Agrarian Capitalism', *Journal of Agrarian Change*, 2(1), pp. 96–119. doi: 10.1111/1471-0366.00026.

Banaji, J. (2002) 'The metamorphoses of agrarian capitalism', *Journal of Agrarian Change*, 2(1), pp. 96–119. doi: 10.1111/1471-0366.00026.

Banik, N. (2018) 'Are loan waivers a panacea for rural distress?', *Economic and Political Weekly*, 53, pp. 14–16.

Bank Officer at NABARD (2020) 'Whats App Call to Karishma Shelar'.

Baruah, S. (2012) *Durable Disorder: Understanding the Politics of Northeast India*. (Durable Disorder: Understanding the Politics of Northeast India), p. 286. doi: 10.1093/acprof:oso/9780195690828.001.0001.

Basole, A. and Basu, D. (2011) 'Relations of Production and Modes of Surplus Extraction in India: Part II - "Informal" Industry', *Economic and Political Weekly*, 46(15), pp. 63–79.

Bayly, C. A. (1985) 'State and Economy in India over Seven Hundred Years', *The Economic History Review*, 38(4), pp. 583–596. doi: 10.2307/2597191.

Benjaminsen, T. A. (2015) 'Political Ecologies of Environmental Degradation and Marginalisation', in Perreault, T. A., Bridge, G., and McCarthy, J. (eds) *The Routledge handbook of political ecology*. London ; New York, NY: Routledge, Taylor & Francis Group.

Bernstein, H. (2003) 'Farewells to the Peasantry', *Transformation: Critical Perspectives on Southern Africa*, 52(1), pp. 1–19. doi: 10.1353/trn.2003.0027.

Bernstein, H. (2010) *Class dynamics of agrarian change*. Halifax, N.S. : Sterling, VA: Fernwood Pub. ; Kumarian Press (Agrarian change and peasant studies series).

Bhaduri, A. (1981) 'Class relations and the pattern of accumulation in an agrarian economy', *Cambridge Journal of Economics*, 5(1), pp. 33–46. Available at:

https://www.scopus.com/inward/record.uri?eid=2-s2.0-0019683856&partnerID=40&md5=6286e9a068370286956ee95fdf335e39.

Bieri, S. (2014) 'New ruralities – old gender dynamics? A reflection on high-value crop agriculture in the light of the feminisation debates', *Geographica Helvetica*, 69(4), pp. 281–290. doi: 10.5194/gh-69-281-2014.

Borras, S. M. *et al.* (2016) 'The rise of flex crops and commodities: implications for research', *The Journal of Peasant Studies*, 43(1), pp. 93–115. doi: 10.1080/03066150.2015.1036417.

Brass, T. (1999) *Towards a comparative political economy of unfree labour: case studies and debates*. London ; Portland, OR: Frank Cass (The library of peasant studies, no. 16).

Bunker, S. G. (1984) 'Modes of Extraction, Unequal Exchange, and the Progressive Underdevelopment of an Extreme Periphery: The Brazilian Amazon, 1600-1980', *American Journal of Sociology*, 89(5), pp. 1017–1064. Available at: http://www.jstor.org.eur.idm.oclc.org/stable/2779082.

Bunker, S. G. (1989) 'Staples, links, and poles in the construction of regional development theories', *Sociological Forum*, 4(4), pp. 589–610. doi: 10.1007/BF01115065.

Burchardt, H.-J. and Dietz, K. (2014) '(Neo-)extractivism – a new challenge for development theory from Latin America', *Third World Quarterly*, 35(3), pp. 468–486. doi: 10.1080/01436597.2014.893488.

Census (2011a) *Census of India*. New Delhi: Office of the Registrar General and Census Commissioner, Ministry of Home Affairs, Government of India.

Census (2001) *Census of India*. New Delhi: Office of the Registrar General and Census Commissioner, Ministry of Home Affairs, Government of India.

Chandra, R. (2018) *Denied land, Indian women stake claims in collectives*, *Reuters*. Available at: https://www.reuters.com/article/us-india-women-farming/denied-land-indian-women-stake-claims-in-collectives-idUSKBN1EZ1TD (Accessed: 14 March 2020).

Chaturvedi, R., Shelar, K. and Singh, K. K. (2018) *MAPTenure: Enabling Tenurial Clarity for Orange Areas of Central India*. Technical Note. New Delhi, India: WRI India. Available at: http://maptenureindia.org/Methodology.

Dhanagare, D. N. (2016) 'Declining Credibility of the Neoliberal State', in Mohanty, B. B. (ed.) *Critical perspectives on agrarian transition: India in the global debate*. Basingstoke: Taylor & Francis Ltd.

Dhawale, A. and Prashad, V. (2018) *The Kisan Long March in Maharashtra*. New Delhi, India: LeftWord.

Dubash, N. K. (2007) 'The Electricity-Groundwater Conundrum: Case for a Political Solution to a Political Problem', *Economic and Political Weekly*, 42(52), pp. 45–55. Available at: http://www.jstor.org.eur.idm.oclc.org/stable/40277126 (Accessed: 29 October 2020).

Elmhirst, R. (2011) 'Introducing new feminist political ecologies', *Geoforum*, 42(2), pp. 129–132. doi: 10.1016/j.geoforum.2011.01.006.

EPW Editorials (2020a) 'Bills of Contention', *Economic and Political Weekly*. Economic and Political Weekly.

EPW Editorials (2020b) 'Imposing New Inequities', *Economic and Political Weekly*. Economic and Political Weekly.

FCI (2020a) 'Statewise Procurement of Rice for RMS 2019-20'. Food Corporation of India. Available at: https://fci.gov.in/app/webroot/upload/Procurement/Statewise%20Procurement%20of%20Rice(KMS%202019-20)_56.pdf (Accessed: 10 October 2020).

FCI (2020b) 'Statewise Procurement of Wheat for RMS 2019-20'. Food Corporation of India. Available at: https://fci.gov.in/app/webroot/upload/Procurement/Statewise%20Procurement%20of%20wheat_57.pdf (Accessed: 10 October 2020).

García-Lamarca, M. and Kaika, M. (2016) '"Mortgaged lives": the biopolitics of debt and housing financialisation', *Transactions of the Institute of British Geographers*, 41(3), pp. 313–327. doi: 10.1111/tran.12126.

Garikipati, S. (2012) 'Microcredit and Women's Empowerment: Through the Lens of Time-Use Data from Rural India', *Development and Change*, 43(3), p. 719. doi: 10.1111/j.1467-7660.2012.01780.x.

Garikipati, S. *et al.* (2017) 'The Cost of Empowerment: Multiple Sources of Women's Debt in Rural India', *The Journal of Development Studies*, 53(5), pp. 700–722. doi: 10.1080/00220388.2016.1205734.

Gerber, J.-F. (2013) 'The Hidden Consequences of Credit: An Illustration from Rural Indonesia: Hidden Consequences of Credit', *Development and Change*, 44(4), pp. 839–860. doi: 10.1111/dech.12045.

Gerber, J.-F. (2014) 'The role of rural indebtedness in the evolution of capitalism', *The Journal of Peasant Studies*, 41(5), pp. 729–747. doi: 10.1080/03066150.2014.921618.

Ghatak, M. and Roy, S. (2007) 'Land reform and agricultural productivity in India: a review of the evidence', *Oxford Review of Economic Policy*, 23(2), pp. 251–269. doi: 10.1093/oxrep/grm017.

Ghazoul, J. and Chazdon, R. (2017) 'Degradation and Recovery in Changing Forest Landscapes: A Multiscale Conceptual Framework', *Annual Review of Environment and Resources*, 42(1), pp. 161–188. doi: 10.1146/annurev-environ-102016-060736.

GoI (1976a) *Report of the National Commission on Agriculture*. New Delhi: Ministry of Agriculture and Irrigation, Government of India.

GoI (2013) *The National Food Security Act, 2013*. Available at: http://www.egazette.nic.in/WriteReadData/2013/E_29_2013_429.pdf (Accessed: 12 October 2020).

GoI (2014) *Key Indicators of Debt and Investment in India - NSS 70th Round 2013*. New Delhi, India: Ministry of Statistics and Programme Implementation - National Sample Survey Office, Government of India. Available at: http://www.mospi.gov.in/sites/default/files/publication_reports/KI_70_18.2_19dec14.pdf (Accessed: 10 May 2020).

GoI (2016) *Desertification and Land Degradation Atlas of India: (Based on IRS AWiFS data of 2011-13 and 2003-05)*. New Delhi, India: Space Applications Centre, Indian Space Research Organisation, Government of India. Available at: https://www.sac.gov.in/SACSITE/Desertification_Atlas_2016_SAC_ISRO.pdf (Accessed: 21 May 2020).

GoI (2018a) *Agricultural Census 2015-16 - All India Report on Number and Area of Operational Holdings*. New Delhi: Agriculture Census Division, Department of Agriculture, Co-Operation & Farmers Welfare Ministry of Agriculture & Farmers Welfare, Government of India.

GoI (2018b) *Agricultural Statistics at a Glance*. New Delhi: Ministry of Agriculture & Farmers Welfare Department of Agriculture, Cooperation & Farmers Welfare, Government of India. Available at: http://agricoop.gov.in/sites/default/files/agristatglance2018.pdf (Accessed: 12 October 2020).

GoI (2019) 'Periodic Labour Force Survey: Annual Report'. Government of India.

GoI (2020) 'Buying of Palm Oil From Malaysia: Rajya Sabha Unstarred Question No.708 To Be Answered on 7 February 2020'. Ministry of Commerce and Industry (Department of Commerce), Government of India. Available at: https://commerce.gov.in/writereaddata/UploadedFile/MOC_637166782599628854_RS-07-02-2020.pdf (Accessed: 20 October 2020).

Government of Maharashtra (2020) *Economic Survey of Maharashtra 2019-20*. Maharashtra, Mumbai: Directorate of Economics and Statistics, Planning Department, Government of Maharashtra. Available at: https://www.maharashtra.gov.in/Site/upload/WhatsNew/ESM_2019_20_Eng_Book.pdf (Accessed: 5 October 2020).

Graeber, D. (2009) 'Debt, violence, and impersonal markets: Polanyian meditations', in Hann, C. and Hart, K. (eds) *Market and Society*. Cambridge: Cambridge University Press, pp. 106–132. doi: 10.1017/CBO9780511581380.007.

Green, W. N. (2020) 'Financial landscapes of agrarian change in Cambodia', *Geoforum*, p. S0016718520300361. doi: 10.1016/j.geoforum.2020.02.001.

Guérin, I., D'Espallier, B. and Venkatasubramanian, G. (2013) 'Debt in Rural South India: Fragmentation, Social Regulation and Discrimination', *The Journal of Development Studies*, 49(9), p. 1155. doi: 10.1080/00220388.2012.720365.

Gulati, A. and Anil Sharma (1994) 'Agriculture under GATT: What It Holds for India', *Economic and Political Weekly*, 29(29), pp. 1857–1863. Available at: http://www.jstor.org.eur.idm.oclc.org/stable/4401487 (Accessed: 1 November 2020).

Harcourt, W. and Nelson, I. L. (eds) (2015) *Practising feminist political ecologies: moving beyond the 'green economy'*. London: Zed Books (Gender, Development and Environment).

IPCC *et al.* (eds) (2014) *Climate Change 2014: Mitigation of Climate Change. Contribution of Working Group III to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change*. Cambridge, United Kingdom and New York, NY, USA: Cambridge University Press.

Jagga, R. (2020) *Punjab farmers have fed country since the Green Revolution, now it must stand by us*, *The Indian Express*. Available at: https://indianexpress.com/article/india/punjab-farmers-

have-fed-country-since-the-green-revolution-now-it-must-stand-by-us-6674989/ (Accessed: 15 November 2020).

Jawaharlal Nehru Krishi Vishwa Vidyalaya (2013) *State of Agriculture in Madhya Pradesh*. Report Submitted to the Ministry of Agriculture, Government of India, New Delhi. Jabalpur, Madhya Pradesh: Jawaharlal Nehru Krishi Vishwa Vidyalaya, Jabalpur (M.P.). Available at: http://jnkvv.org/PDF/AERC/Study-112.pdf (Accessed: 10 October 2020).

Joshi, R. (2020) 'Whats App Call to Karishma Shelar'.

Kandikuppa, S. (2018) *To What Extent Are India's Farmers Indebted?* Available at: https://thewire.in/agriculture/dimensions-of-farmers-indebtedness-the-extent-of-indebtedness (Accessed: 4 January 2019).

Kinkaid, E. (2019) 'Embodied political ecology: Sensing agrarian change in north India', *Geoforum*, 107, pp. 45–53. doi: 10.1016/j.geoforum.2019.10.013.

Kulkarni, S. (2020) 'Whats App Call to Karishma Shelar'.

Kumar, R. (2010) 'Mandi Traders and the Dabba: Online Commodity Futures Markets in India', *Economic and Political Weekly*, 45(31), pp. 63–70. Available at: http://www.jstor.org.eur.idm.oclc.org/stable/20764364 (Accessed: 18 October 2020).

Kumar, R. (2020) 'Skype Call to Karishma Shelar'.

Lambin, E. F. *et al.* (2001) 'The causes of land-use and land-cover change: moving beyond the myths', *Global Environmental Change*, 11(4), pp. 261–269. doi: 10.1016/S0959-3780(01)00007-3.

Li, T. M. (2014) 'What is land? Assembling a resource for global investment', *Transactions of the Institute of British Geographers*, 39(4), pp. 589–602. doi: 10.1111/tran.12065.

Li, T. M. (2015) 'Can there be food sovereignty here?', *The Journal of Peasant Studies*, 42(1), pp. 205–211. doi: 10.1080/03066150.2014.938058.

Luxemburg, R. (1968) *The Accumulation of Capital*. New York and London: Modern Reader Paperbacks.

Luxemburg, R. (2013) *The complete works of Rosa Luxemburg. Vol. 1 1: Economic writings [...]*. London: Verso Books.

M. L. Jhala (1984) 'Restructuring Edible Oil and Oilseeds Economy of India', *Economic and Political Weekly*, 19(39), pp. A111–A128. Available at: http://www.jstor.org.eur.idm.oclc.org/stable/4373618 (Accessed: 19 September 2020).

McMichael, P. (2007) 'Feeding the world: agriculture, development and ecology', *Socialist register*, 43.

McMichael, P. (2013) 'Value-chain agriculture and debt relations: contradictory outcomes', *Third World Quarterly*, 34(4), pp. 671–690.

Mihir Shah, Rangu Rao and P. S. Vijay Shankar (2007) 'Rural Credit in 20th Century India: Overview of History and Perspectives', *Economic and Political Weekly*, 42(15), pp. 1351–1364.

Available at: http://www.jstor.org.eur.idm.oclc.org/stable/4419471 (Accessed: 19 September 2020).

Mohan, R. (2006) 'Agricultural Credit in India: Status, Issues and Future Agenda', *Economic and Political Weekly*, 41(11), pp. 1013–1023. Available at: http://www.jstor.org.eur.idm.oclc.org/stable/4417965 (Accessed: 28 October 2020).

Mohanty, B. B. (2016) 'Introduction agrarian transition: From classic to current debates', *Critical Perspectives on Agrarian Transition: India in the Global Debate*, pp. 1–40. doi: 10.4324/9781315651552.

Mohanty, B. B. and Lenka, P. K. (2016) 'Neoliberal reforms, agrarian capitalism and peasantry', in Mohanty, B. B. (ed.) *Critical perspectives on agrarian transition: India in the global debate*. Basingstoke: Taylor & Francis Ltd.

Mohanty, S. K. and Mishra, S. (2020) 'Regulatory reform and market efficiency: The case of Indian agricultural commodity futures markets', *Research in International Business and Finance*, 52, p. 101145. doi: 10.1016/j.ribaf.2019.101145.

Mullassery Sathiamma, S. (S) (2020) 'Video Call to Karishma Shelar'.

NABARD (2019) 'Highlights of the SHG-Bank Linkage Programme 2018-19'. NABARD. Available at: https://www.nabard.org/auth/writereaddata/File/SHG-BLP%20as%20on%2030%20June%202019.pdf (Accessed: 30 October 2020).

Nightingale, A. J. (2011) 'Bounding difference: Intersectionality and the material production of gender, caste, class and environment in Nepal', *Geoforum*, 42(2), pp. 153–162. doi: 10.1016/j.geoforum.2010.03.004.

NSSO (1998) 'Debt and Investment Survey: NSS Forty Eight Round (January - December 1992)'. National Sample Survey Organisation, Department of Statistics, Government of India. Available at: http://mospi.nic.in/sites/default/files/publication_reports/419_final.pdf (Accessed: 12 July 2020).

NSSO (2014) 'Key Indicators of Debt and Investment in India'. Ministry of Statistics and Programme Implementation, National Sample Survey Office, Government of India. Available at: http://www.mospi.gov.in/sites/default/files/publication_reports/KI_70_18.2_19dec14.pdf (Accessed: 20 July 2020).

NSSO (2016) *Income, Expenditure, Productive Assets and Indebtedness of Agricultural Households in India - NSS 70th Round (January– December 2013)*. National Sample Survey Office, Ministry of Statistics and Programme Implementation, Government of India. Available at: http://mospi.nic.in/sites/default/files/publication_reports/nss_rep_576.pdf.

O'laughlin, B. (2016) 'Bernstein's Puzzle: Peasants, Accumulation and Class Alliances in Africa', *Journal of Agrarian Change*, 16, pp. 390–409.

Padhi, R. (2009) 'On Women Surviving Farmer Suicides in Punjab', *Economic & Political Weekly*, 44(19), pp. 53–59.

Panditrao Ghunnar, P. and Bhatt Hakhu, A. (2018) 'The Aftermath of Farmer Suicides in Survivor Families of Maharashtra', *Economic & Political Weekly*, LIII(5), pp. 47–53.

PARI (No Date) *The Kisan Mukti March in Delhi: full coverage*, *People's Archive of Rural India*. Available at: https://ruralindiaonline.org/articles/the-kisan-mukti-march-in-delhi-full-coverage/ (Accessed: 16 November 2020).

Parth, M. N. (2018) *Why Tens of Thousands of Maharashtra's Farmers Are Marching Their Way to Mumbai*, *The Wire*. Available at: https://thewire.in/agriculture/maharashtra-farmers-protest-march-mumbai (Accessed: 21 May 2020).

Patel, R. (2013) 'The Long Green Revolution', *Journal of Peasant Studies*, 40(1), pp. 1–63. doi: 10.1080/03066150.2012.719224.

Patel, R. and McMichael, P. (2009) 'A Political Economy of the Food Riot', *Review (Fernand Braudel Center)*, 32(1), pp. 9–35. Available at: www.jstor.org/stable/40647787.

Patidar, N. (2020) 'Whats App Call to Karishma Shelar'.

Patnaik, U. (1988) 'Ascertaining the economic characteristics of peasant classes-in-themselves in rural India: A methodological and empirical exercise', *The Journal of Peasant Studies*, 15(3), pp. 301–333. doi: 10.1080/03066158808438365.

Patnaik, U. (2003) 'Global Capitalism, Deflation and Agrarian Crisis in Developing Countries', *Journal of Agrarian Change*, 3(1–2), pp. 33–66. doi: 10.1111/1471-0366.00050.

Patnaik, U. (2016) 'Capitalist trajectories of global interdependence and welfare outcomes: the lessons of history for the present', in Mohanty, B. B. (ed.) *Critical perspectives on agrarian transition: India in the global debate*. Basingstoke: Taylor & Francis Ltd.

Press Information Bureau (2018) 'Growing Migration by Men is Causing "Feminisation" of Agriculture Sector, Says Economic Survey'. Government of India, Ministry of Finance. Available at: https://pib.gov.in/pressreleaseshare.aspx?prid=1518099 (Accessed: 13 December 2019).

Press Information Bureau (2019) 'Key Indicators of Situation of Agricultural Households in India'. Government of India, Ministry of Statistics & Programme Implementation. Available at: https://pib.gov.in/newsite/printrelease.aspx?relid=113796 (Accessed: 13 December 2019).

PRS India (2017) *State of Agriculture in India*, *PRSIndia*. Available at: https://www.prsindia.org/policy/discussion-papers/state-agriculture-india (Accessed: 10 April 2020).

Pulley, R. (1989) *Making the Poor Creditworthy - A Case of the Rural Development Program in India*. Washington, D.C.: The World Bank.

Rajeev, M. and Nagendran, P. (2018) 'Are Gold Loans Glittering for Agriculture?', *Economic & Political Weekly*, 53(26–27), pp. 32–38.

Rajeev, M., Vani, B. P. and Bhattacharjee, M. (2011) 'Credibility of Equal Access to Credit: Does Gender Matter?', *Economic and Political Weekly*, 46(33), pp. 76–79. Available at: www.jstor.org/stable/23017852 (Accessed: 22 June 2020).

Ramachandran, V. K. and Swaminathan, M. (2002) 'Rural Banking and Landless Labour Households: Institutional Reform and Rural Credit Markets in India', *Journal of Agrarian Change*, 2(4), pp. 502–544. doi: 10.1111/1471-0366.00044.

Raman, S. (2019) *73.2% Of Rural Women Workers Are Farmers, But Own 12.8% Land Holdings*, *IndiaSpend*. Available at: https://www.indiaspend.com/73-2-of-rural-women-workers-are-farmers-but-own-12-8-land-holdings/ (Accessed: 13 September 2019).

Ramprasad, V. (2019) 'Debt and vulnerability: indebtedness, institutions and smallholder agriculture in South India', *The Journal of Peasant Studies*, 46(6), pp. 1286–1307. doi: 10.1080/03066150.2018.1460597.

Rana, P. (2017) 'Development of Irrigation and Its Impact on Agriculture in Punjab: 1965-66 to 2010-11', *IOSR Journal of Agriculture and Veterinary Science (IOSR-JAVS)*, 10(6), pp. 56–63. Available at: https://www.iosrjournals.org/iosr-javs/papers/Vol10-issue6/Version-2/J1006025763.pdf (Accessed: 13 October 2020).

Raynolds, L. T. *et al.* (1993) 'The "new" internationalization of agriculture: A reformulation', *World Development*, 21(7), pp. 1101–1121. doi: 10.1016/0305-750X(93)90002-Q.

Reddy, D. N. (2016) 'Contours of the agrarian question: towards political question of "the peasantry" in contemporary India', in Mohanty, B. B. (ed.) *Critical perspectives on agrarian transition: India in the global debate*. Basingstoke: Taylor & Francis Ltd.

Rocheleau, D. E., Thomas-Slayter, B. P. and Wangari, E. (1996) *Feminist political ecology: global issues and local experiences*. London; New York: Routledge.

S. Raj, D. and Prabhu, E. A. (2018) 'Agricultural Loan Waiver: A Case Study of Tamil Nadu's Scheme', *Reserve Bank of India Occasional Papers*, 39(1 & 2), pp. 1–36. Available at: https://rbidocs.rbi.org.in/rdocs/Content/PDFs/1ALWACTNS663D5B90401B49C2A4EE0C0E304DB1D6.PDF (Accessed: 20 June 2020).

Sajane, A. *et al.* (2011) 'Economic evaluation of kisan credit card scheme *', 24.

Sarkar, A. (2020) 'Groundwater irrigation and farm power policies in Punjab and West Bengal: Challenges and opportunities', *Energy Policy*, 140. doi: 10.1016/j.enpol.2020.111437.

Sarkar, A. and Das, A. (2014) 'Groundwater Irrigation-Electricity-Crop Diversification Nexus in Punjab: Trends, Turning Points, and Policy Initiatives', *Economic and Political Weekly*, 49(52), pp. 64–73. Available at: http://www.jstor.org/stable/24481208 (Accessed: 10 October 2020).

Sassen, S. (2010) 'A Savage Sorting of Winners and Losers: Contemporary Versions of Primitive Accumulation', *Globalizations*, 7(1–2), pp. 23–50. doi: 10.1080/14747731003593091.

Sassen, S. (2013) 'Land Grabs Today: Feeding the Disassembling of National Territory', *Globalizations*, 10(1), pp. 25–46. doi: 10.1080/14747731.2013.760927.

Sassen, S. (2014) *Expulsions: brutality and complexity in the global economy*. Cambridge, Massachusetts: The Belknap Press of Harvard University Press.

Sassen, S. (2015) 'At the systemic edge', *Cultural Dynamics*, 27(1), pp. 173–181. doi: 10.1177/0921374014567395.

Sassen, S. (2017) 'Predatory Formations Dressed in Wall Street Suits and Algorithmic Math', *Science, Technology and Society*, 22(1), pp. 6–20. doi: 10.1177/0971721816682783.

Sassen, S. (no date) 'Professor Saskia Sassen on Geographies of Expulsion'. Available at: http://blog.gdi.manchester.ac.uk/saskia-sassen-geographies-expulsion/ (Accessed: 6 October 2020).

Sato, C. and Soto Alarcón, J. M. (2019) 'Toward a postcapitalist feminist political ecology' approach to the commons and commoning', *International Journal of the Commons*, 13(1), p. 36. doi: 10.18352/ijc.933.

Schrader, H. (1997) *Changing financial landscapes in India and Indonesia: sociological aspects of monetization and market integration*. Münster: Lit (Market, culture and society, 2).

Shankar, P. S. V. (2005) 'Four Decades of Agricultural Development in MP', *Economic and Political Weekly*. Economic and Political Weekly.

Sharma, R. (2020) 'Skype Call to Karishma Shelar'.

Shiva, V. (1991) *Ecology and the politics of survival: conflicts over natural resources in India*. Tokyo, Japan : New Delhi : Newbury Park: United Nations University Press ; Sage Publications.

Sidhu, H. S. (2002) 'Crisis in Agrarian Economy in Punjab', *Economic and Political Weekly*. Economic and Political Weekly.

Singh, G. *et al.* (2017) 'Indebtedness among Farmers and Agricultural Labourers in Rural Punjab', *Economic & Political Weekly*, 52(6), pp. 51–57.

Singh, P. (2020) 'BJP's Farming Policies', *Economic and Political Weekly*. Economic and Political Weekly.

Singh, S. and Bhogal, S. (2020) 'Punjab's Agricultural Labourers in Transition', *Economic and Political Weekly*. Economic and Political Weekly.

Sinha, A. (2004) 'The Changing Political Economy of Federalism in India: A Historical Institutionalist Approach', *India Review*, 3(1), pp. 25–63. doi: 10.1080/14736480490443085.

Sinha, S. (2008) 'Lineages of the Developmentalist State: Transnationality and Village India, 1900-1965', *Comparative Studies in Society and History*, 50(1), pp. 57–90. Available at: http://www.jstor.org.eur.idm.oclc.org/stable/27563655 (Accessed: 22 September 2020).

SOPPECOM (2020) 'Crushed Hopes: The Plight of Women Cane Cutters in Maharashtra'. MAKAAM. Available at: http://makaam.in/events/ardha-koyta-online-consultation/ (Accessed: 23 September 2020).

Srinivasan, V. (2017) 'From Groundwater Regulation to Integrated Water Management', *Economic and Political Weekly*. Economic and Political Weekly.

Taylor, M. (2013) 'Liquid Debts: credit, groundwater and the social ecology of agrarian distress in Andhra Pradesh, India', *Third World Quarterly*, 34(4), pp. 691–709. doi: 10.1080/01436597.2013.786291.

Taylor, M. and Bhasme, S. (2019) 'The political ecology of rice intensification in south India: Putting SRI in its places', *Journal of agrarian change*, 19(1), pp. 3–20.

Thomas, P. *et al.* (1994) 'Dunkel Text: Implications for Rural Sector', *Economic and Political Weekly*, 29(13), pp. A42–A52. Available at: http://www.jstor.org.eur.idm.oclc.org/stable/4400998 (Accessed: 1 November 2020).

Thorner, D. (1960) 'The All-India Rural Credit Survey-Viewed as a Scientific Enquiry', *Economic and Political Weekly*. Economic and Political Weekly.

Waghale, A. (2020) 'Whats App Call to Karishma Shelar'.

Yadu, C. R. and B, S. (2016) 'Agrarian Question in India - Indications from NSSO's 70th Round', *Economic & Political Weekly*, LI(16), pp. 20–23.

Ye, J. *et al.* (2020) 'The incursions of extractivism: moving from dispersed places to global capitalism', *The Journal of Peasant Studies*, 47(1), pp. 155–183. doi: 10.1080/03066150.2018.1559834.