

# Exploring regenerative agriculture through farmers' perceptions of more-than-human interactions

A relational analysis of regenerative transformation in the Eastern Ghats, India

By

Sumamani Vedula

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# Chapter 1 Introduction

#### 1.1 Background

Modern agricultural practices have been dominated by industrial-productivist paradigms resulting in severe degradation of our ecological, environmental, and social systems. In the current debates on the failures of the dominant food system practices and future trajectories towards sustainable production, narratives around economic (yield) and ecological (conservation) considerations prevail (Béné et al., 2019). The underlying assumptions of these sustainable narratives exemplify not only a lack of sociological perspectives, but a fundamental dichotomy between humans and nature, where relations are severed, and humans are actively removed from landscape (Fisher et al., 2014). Studying places of food production using a sectoral lens through a structural and reductionist approach dismisses the sociological, cultural and social value created through the interactions and relations between people and place (Gordon et al., 2021). This thesis investigates alternatives to these dominant myopic narratives through a case study of regenerative agriculture in India.

India, an agrarian economy supports 18% of the global population on only 2.4% of the world's land mass, leading to a huge pressure on land and other natural resources to feed its population (Ray, 2011). Around 86% of farmers in India are smallholders with <2 acres of land (Annual survey of state of marginal farmers in India, 2023). Traditionally, farming practices involved growing diverse crops as polyculture using organic and biodynamic methods, incorporating sustainability and spirituality within the food systems (Bisht, 2020). Under the British rule, Indian agriculture witnessed a massive structural transformation that shifted from a subsistence-based and labour-intensive system to a modernized, capital and knowledge intensive one (Gulati et al., 2022). This shift from food crops to profit making cash crops contributed to disasters in famine years (1943) which led to major food insecurity in the country (Gulati et al., 2022). In the 1960s, to achieve food security, India witnessed the Green Revolution, when the nation shifted towards modern agricultural practices led by productivist paradigms. Intensive cropping systems involving injudicious use of fertilizers and pesticides during this period had increased crop productivity several fold, but also had a detrimental impact on the soil health leading to land degradation and eventual reduction in crop productivity the country has been facing in recent years. Modern agriculture in India involves extension of cultivation on marginal lands and over-exploitation of groundwater resources leading to large-scale land desertification in the country. Majority of the farmers are facing extreme degradation of soil due to erosion, nutrient depletion and loss of soil organic matter and are vulnerable to climate change impacts owing to frequent droughts and erratic rainfall patterns. This is posing a huge threat to their livelihoods and overall food security of the nation. There is a growing consensus that Indian agriculture has reached a stage where it needs to move from resource-intensive agricultural methods to more sustainable and environment-friendly farming (Tiwari, 2003; Srivastava et al., 2016, Meena et al., 2023). Many alternatives categorized under sustainable agricultural practices have surfaced in recent years. Among these alternatives, regenerative agriculture has been gaining tremendous prominence as a transformational paradigm towards sustainable food production globally (Giller et al., 2021). Specifically in India, regenerative agriculture has been an emerging concept that is considered to hold enormous potential to restore soil health and productivity in degraded landscapes while delivering financial benefits to smallholder farmers (TAAS et al., 2021, Meena et al., 2023, CEEW SA Report, 2021). However it is identified that transitioning to regenerative agriculture is challenging for smallholder farmers in India due to lack of financial capacities and supportive policies, loss of traditional knowledge and fostered extractivist thinking that have separated them from nature as opposed to what it was historically (Bisht, 2020).

Throughout academic literature and other media sources, there have been various definitions and descriptions of regenerative agriculture - primarily based on ecological processes involved (e.g., use of cover

crops, the integration of livestock, and reducing or eliminating tillage), related ecological outcomes (e.g., improving soil health, sequestering carbon, and increasing biodiversity) and economic benefits (diversified livelihoods, better incomes etc.) (Newton et al., 2021). Regenerative agriculture has been predominantly viewed as a system of principles, practices and outcomes that help restore soil health and ecosystems contributing to the betterment of the environment and economic prosperity (Schreefel et al., 2020) and the literature has largely focused on assessment of these practices. This research highlights that such ecological and economical elaborations using positivist, scientific and structural approaches offer a myopic view on regenerative agriculture and transformative food systems. Specific to Indian context, regenerative agriculture remains underexplored, with existing literature primarily focusing on its effects on soil health, biodiversity, and farmers' livelihoods.

Regenerative agriculture is deeply rooted in human-nature relationships based in specific places and contexts, acknowledging that regenerative farming practices are shaped by these relationships, local conditions, cultures, and histories (Kallio et al., 2023; Gordon et al., 2021). By studying the socio-ecological and cultural interlinkages and aspects of co-shaping of relations within regenerative agriculture practices (Ploeg, 2014), it can be argued that places of food production can be considered as social and cultural sites of engagement, and these interlinkages are crucial to holistically understand regenerative processes in agricultural transformation. Exploring regenerative agriculture through a relational and sociological approach is important because it provides a holistic view of the agricultural practices that go beyond the purely scientific analysis of outcomes (Seymour et al., 2021). This approach allows the exploration of complex dynamics between human and non-human actors within agricultural systems, as well as the cultural beliefs and traditional knowledge that inform agricultural practices. In the Indian context, this perspective is crucial for understanding the motivations, challenges, and opportunities farmers recognize when adopting regenerative practices. Focusing on sociological dimensions, such as values of care, community dynamics, and cultural connections to the land, can help gain insights into how these factors contribute to transforming both physical landscapes and farmers' mindsets. These insights could be beneficial to a broad set of stakeholders aiming to advance and scale the adoption of regenerative agriculture in India. However, there are many research gaps that hinder a holistic understanding of regenerative agriculture globally and in India, particularly regarding the integration of sociological, cultural and relational aspects. First, the concept of regenerative agriculture in India is not much explored using sociological and relational dimensions to understand the complex, place-based, more-than-human interactions and relationships involved within regenerative practices. Second, there is limited literature capturing smallholder farmers' perceptions and experiences with the adoption of regenerative practices and what influences their decision-making. Third, the existing literature does not address the loss or marginalisation of traditional farming knowledge and often-ignored cultural nuances specific to localized contexts, thus neglecting their significance in shaping farmers attitudes and regenerative practices. This thesis, based on qualitative research on farmers practicing regenerative agriculture in Eastern Ghats region in India, aims to contribute towards addressing the aforementioned gaps in existing literature. This thesis emphasizes that understanding regenerative agriculture through relational and sociological dimensions is crucial for comprehending its transformative potential, thereby supporting wider regenerative transitions across India.

#### 1.2 Objectives and research questions

This research aims to focus on the sociological dimensions associated with transformative food system change models (such as regenerative agriculture), and aspires to bridge the gap around understanding of interconnectedness and interdependent aspects within regenerative agriculture. It aims to look into social, cultural and other place-based relationalities in more-than-human interactions associated with farming practices by investigating and understanding farmers' perceptions, experiences, motivations, attitudes, and values. This will aid in understanding what farmers care for i.e., how they make ethical decisions towards nature and ecosystem as a whole through their regenerative practices. This approach will also help in exploring transformative paradigms such as regenerative agriculture more comprehensively as a socio-

ecological and a relational concept that integrate farming systems, farmers, non-human entities, communities, places and ecosystems.

This research aims to answer the following general and specific research questions:

How do more-than-human interactions, within regenerative agricultural practices, contribute to landscape transformation in the tribal communities of Eastern Ghats, India?

- How do farmers perceive their interactions with their environment (more-than-human actors) within their farming practices?
- How are their practices informed by traditional farming knowledge coupled with cultural beliefs and values?
- How do farmers perceive transformation in terms of their motivations, values and objectives?

#### 1.3 Context: Literature Review

#### 1.3.1 Understanding agri-food systems as socio-ecological systems

There is plethora of literature around defining and describing agri-food systems as complex and diverse socio-ecological systems that involve a whole range of actors such as people, environment, institutions, infrastructures and inputs, activities and outcomes such as nutrition and health, socio-economic status and environmental conditions (Ericksen, 2008; Leeuwis et al., 2021; Caron et al., 2018). There are multiple environmental, social, political, and economic determinants, including external elements influencing the agri-food systems (Ericksen, 2008; Ericksen et al., 2010; FAO, 2018a; Stefanovic et al., 2020). This implies that agri-food systems are embedded in complex ecological, economic and social processes, with dynamic interactions that makes them vulnerable to short-term shocks and long-term stresses like climate change (Thompson, J. et al., 2009). Current agri-food systems are dominated by industrial-productivist paradigms and have evolved in unsustainable directions over the last fifty years (De Schutter, 2017). Wittman (2009) elaborates on how current productivist paradigms dominating the agri-food systems have created a metabolic rupture between society and nature and how this has led to "widespread rural dislocation and environmental degradation and disrupted the practice of agrarian citizenship through a series of interlinked and evolving philosophical, ideological, and material conditions" (Wittman, 2009, p. 805). According to the IPCC 2019 report, agri-food systems are heavily pressured by environmental degradation with serious impacts such as erratic weather patterns, land degradation, food insecurity and biodiversity loss. Planet's well-being, people's health and nutrition, and societies' stability and overall socio-ecological resilience are severely threatened by the industrial globalized agriculture driven by greed and profits (Shiva, 2016). Achieving socio-ecological resilience requires a holistic transformation that involves reconstruction of values, perceptions and ways of thinking, interacting and being along with changes to the variables that make up the socio-ecological system (Brown 2014; Folke et al. 2010). This calls for an urgent need for systemic transformation of agri-food systems that incorporates sustainable and socially inclusive patterns of food production and consumption (Caron et al., 2018; Fanzo et al., 2020; FAO, 2018; Herrero et al., 2021). There is plenty of literature around sustainable transformation focusing strongly on the ecological aspects in terms of resource use efficiency (Binder et al., 2010, Ness et al., 2007, Von Wirén-Lehr, 2001) which presents an important but a myopic view on systemic change. It lacks to embed and analyse the agri-food system within the broader socio-ecological context using sociological dimensions (Francis et al., 2003, Hammond and Dubé, 2012, Lamine, 2011). This furthers the need for my research that is trying to present a more holistic view of agri-food system transformation.

#### 1.3.2 Regenerative agriculture: current narratives and descriptions

This holistic perspective of agri-food system transformation is crucial in aligning with the emergence of diverse sustainable food production methods, such as agroecology, permaculture, organic farming,

agroforestry, and regenerative agriculture, which are gaining popularity in response to the urgent need for agri-food systems change. Amongst these methods, I will focus on regenerative agriculture. Regenerative agriculture as a term was first coined in the 1980s by Robert Rodale as a "holistic approach to farming that included social and economic improvements alongside environmental benefits" (Rodale Institute, 2019). Regenerative agriculture has been proposed as an alternative means of producing food that may have lower—or even net positive—environmental and/or social impacts (Rhodes, 2017). There is no fixed definition of regenerative agriculture and it varies from being a set of principles and practices that improves ecosystem services to a design concept that helps in improving resource use efficiency and sequestering carbon (Newton et al., 2021). These definitions are structural and reductionist in their approaches since they mostly emphasize on the ecological processes, outcomes and economic benefits (Sands et al., 2023). The conceptualization of regenerative agriculture in current narratives majorly highlight biophysical dimensions and exclude the socio-ecological and socio-economic dimensions in which the concept of being regenerative is deeply rooted in (Sands et al., 2023). Even if some places such as practitioner websites emphasize on both socio-economic and biophysical dimensions, they often exclude non-material dimensions such as traditional farming knowledge, cultural values and beliefs, spirituality and norms of reciprocity (Newton et al., 2020, Sands et al., 2023). An attempt towards a logical definition of regenerative agriculture was made by (Schreefel et al., 2020) -

"an approach to farming that uses soil conservation as the entry point to regenerate and contribute to multiple provisioning, regulating and supporting ecosystem services, with the objective that this will enhance not only the environmental, but also the social and economic dimensions of sustainable food production"

Even this definition lacks the inclusion of cultural aspects (e.g., contexts, values and norms) (Millennium Ecosystem assessment, 2005). Discussions around the Western conceptualization of regenerative agriculture typically marginalize and alienate farmers their role as stewards of the land they inhabit and cultivate and constrict the transformative potential of regenerative approaches by ignoring deeper systemic issues (Santos, 2014). These issues can be manifested in social justice, power inequalities, cultural contexts, racial and gender (Ryan, 2022). Although, there is a research focussing on viewing regenerative agriculture through a 'more-than-human' ethics of care lens in New Zealand (Seymour et al., 2022). In this study, farmers have described relationships with their environment rooted in mutuality, reciprocity, interdependence and trust with both human and non-human entities. There are other researches which have explored the 'more-than-human' concept within agricultural contexts arguing how the agricultural systems encompass dynamic and relational interactions. The relational aspects are considered significant to transformation as they contain mindset shifts crucial to bring about meaningful changes within humanhuman and human-nature relations (Seymour et al., 2021). The perspective on regenerative agriculture is evolving into a novel, dynamic, and multifaceted conceptual framework that challenges the conventional industrial and production-focused farming paradigm (Gordon et al. 2021). However, these kinds of studies are very few. There are some studies that have noted that regenerative agriculture is inherently place-based (Rahman et al., 2024). But there is hardly any literature that primarily focuses on the need of using placebased care ethics to understand how complex interactions within the context of specific places governs the minds of living entities across community and the overall process of transformation. Majority of the current narratives don't tap into the relational dimension of the agri-food systems, which furthers the need of this research that aims to understand the complex place-based socio-ecological interactions involved within the ecosystem. This gap in the literature underscores the importance of frameworks such as ones introduced by Massey (1995), which provide valuable insights into agricultural transformations through a nuanced and relational understanding of place.

#### 1.3.3 Understanding agricultural transformations through a sense of place

"'Places' may be imagined as particular articulations of these social relations, including local relations 'within' the place and those many connections which stretch way beyond it" – Doreen Massey (1994)

Massey's work on place provides a crucial framework to understand agricultural transformations through a sense of place. She emphasizes that places are not static, bound entities, rather dynamic, relational, open and interconnected. Massey also describes how past manifests in places through physical structures, names, memories, culture and conscious or unconscious historical constructions. There is two-way relationship between past and present in the making of a place. As the past shapes our present, the current perspectives and needs also influence how past is interpreted or constructed. Through the concept of 'progressive sense of place', Massey advocated for 'rethinking of place that embraces its dynamic and interconnected nature which is open to change and diversity' (Massey, 1995; Gibson-Graham, 2008). This involves recognizing the multiple identities and histories that constitute a place and comprehending how local and global processes interact. In the context of agricultural transformations, this implies recognizing that local farming practices are influenced by and connected to global processes, markets and environmental challenges. She argues that places embody multiple identities and are full of internal conflicts. For instance, farmers, middlemen, consumers and policymakers may have conflicting visions on land use and food production. Understanding these diverse perspectives is important for facilitating transformative change. Progressive sense of place also acknowledges power relations embedded in place-making. Within agri-food systems, these power relations can be used to understand how various actors shape farming landscapes and practices and how transformative narrative can challenge the existing power structures. Place-making is a continual process and Massey highlights the importance of both rootedness and openness in understanding a place. This dual perspective is significant for agricultural systems recognizing the embeddedness in local knowledge and traditions and new contemporary ideas and approaches. Using Massey's sense of place, agri-food systems can be better understood as a complex interplay between local and global forces involving multiple stakeholders and being continuously shaped by the nature of change in farming systems. Thus, it can be inferred that agricultural transformations are deeply rooted in specific places while also being part of global processes. Researchers across various disciplines have highlighted the natural, social, and cultural dimensions of place, emphasizing how humans experience and interpret their surroundings (Thomas & Cross, 2007, Tuan 1977). Geographical location indicates spatial coordinates, landscape covers the natural environment while meaning of place encompasses cultural and social dimensions, including individual and community attachments and interactions within a place (Gieryn, 2000; Shrivastava & Kennelly, 2013). The intricate relationships between people, place and agricultural practices are particularly evident in India, where the cultural and social dimensions of farming are deeply intertwined with the country's historical and geographical context, at least till the introduction of modern paradigms.

#### 1.3.4 Evolution of Indian agricultural landscape

India is the second largest producer of wheat and rice which are the most important staple food crops throughout the globe. India has 60% of its land under cultivation with 86% of the farmers as smallholdings owners, implying they farm on a land that is smaller than 2 acres in size. Historically, farmers in India practiced polyculture growing various crops at the same time. Farming was mostly for subsistence and followed sustainable methods (Bisht, 2020). Most of the farming was done by the tribal and indigenous communities who practiced swidden/shifting agriculture involving long fallow periods that allowed soil fertility to recover after one to two years (Spencer 1966). Agriculture in India was predominantly led by women who traditionally held the knowledge of ecological practices such as working with seed, biodiversity, soil, and water in alignment with nature's laws (Shiva, 2016). Farming practices and the farmers way of living involved close interactions within the natural and physical environments and cultural adaptation which helped them gain location specific local knowledge (Ota et al., 2020). British colonialism in India led to a transformative shift of agri-food systems from growing sustainable and staple food crops for community living to profit making, input intensive and cost heavy cash crops resulting in major food insecurity during the famine period. Karl Marx also elaborated upon this force transformation of Indian Agriculture and the destruction of self-sufficient rural society of India under the rule of the British as a critique to modern capitalism. The famine period gave rise to the Green Revolution in India in the 1960s to combat food insecurity. This movement was based on modern productivist paradigms driven by western exploitative mindset incorporating intensive cropping systems, monocultures, injudicious use of fertilizers, pesticides and groundwater resources (Choudhary et al., 2018; Singh & Benbi, 2016). The green revolution which was technology and innovation driven, led to an increase in crop productivity in the short term but resulted in long term detrimental impacts. It led to deteriorating soil health and depleting groundwater resources leading to land desertification and degradation, reducing yields and increasing costs of production, job-driven out migration of rural youth and family labour force, unsustainable traditional farming landscapes, loss of indigenous knowledge and farmer suicides. Indian agriculture, similar to the global modern agri-food systems, has reached a stage where it needs to move from resource-intensive agricultural methods to a more sustainable, environment and ecosystem friendly farming (Kaur, 2014).

There has been an emergence of sustainable alternatives for food production in India since the last decade. These alternatives include agroforestry, organic farming, permaculture, agroecology and natural farming. Regenerative agriculture started gaining prominence in India much later but it is gradually gaining momentum in the country as a promising sustainable farming method (CEEW Report, 2021). Many farmers are shifting from modern agriculture to regenerative agriculture with an objective of restoring their degraded lands. This transformational movement is not limited to achieving ecological and economic objectives but is also significant in terms of farmers' and other stakeholders' changing mindsets and behaviours. There is limited literature on the prevalence of regenerative agriculture in India. There is a massive gap in literature that taps into exploring regenerative agriculture in India as a socio-ecological, relational and a place-based transformative model. A shift especially in the mindsets of tribal and indigenous farmers who have made the transition to regenerative agricultural practices is important to be explored and understood. Their perceptions and experiences must be shared through academic literature for a holistic understanding of regenerative agriculture as a transformative approach to sustainable food production. This research can be a good contribution in this direction as it aims to understand regenerative agriculture through a place-based, sociological and relational dimension through farmers' perceptions, beliefs and values.

# Chapter 2 Theoretical framework

#### 2.1 Relationality: Understanding places of regeneration

Karl Marx theorized socio-ecological metabolism elaborating on how modern productivist agricultural paradigms have created a "metabolic rift" between humans and nature. There has been a creation of human/nature binaries rooted in westernized, European conceptualization of the natural world (Cronon, 1996; Sundberg, 2014) which led to the shifting of behaviours and perceptions that views nature as a separate entity meant to serve the exploitative needs of humans (Schumacher, 1973). The human-nature rupture and the hetero-patriarchal notions embedded in the modern capitalist agriculture has enforced and reinforced power inequalities reducing the stewardship of farmers to farm in traditional care-full socio-ecological ways as often embodied by many indigenous cultures and led to increase in the loss of indigenous knowledge and diversity in production methods (Laymen et al., 2022; Sundberg, 2014).

Agri-food systems are complex socio-ecological systems where the relations and interactions between the components of the system are more important to understand the properties and behaviours of the system rather than the properties of individual components themselves (Preiser et al., 2018). Agriculture has always been relational where humans are primary actors for agricultural transformations in a more-than-human world with no culture-nature binary. Farms have been a process of becoming where "becoming is an outcome of dynamic networks consisting of heterogeneous relationships and actors existing and exerting agency at multiple scales and across time" (Gosnell et al., 2019, p. 5). According to Bawaka-Country et al. 2013, ontology of co-becoming perceives all beings as coming into existence through relationships. When farmers and their ecosystems are structurally coupled, it is an enablement of what Mang and Reed (2012) term "co-evolving mutualism" — "the increasing and mutually beneficial integration of human and natural systems that supports their co-evolution" (Mang and Reed 2012, p. 34). Relational approach to agri-food systems goes beyond the structuralism and individualism dichotomy and views social and ecological processes as co-evolving and co-constituted embedded within the lived experiences and everyday practices (Noorgard, 1994; Haider, 2021). The relational ontology of "more-than-humanism" reinforces humans and environment as co-constituting and co-produced (Booth 2013) and therefore highlights these relationships as critical components of transformative change.

The integration of human and natural systems supports the co-evolving mutualism between human and non-human spheres, which take place at various levels across cultural and ecological systems, through language, diet, behaviour, and experience (Gordon et al., 2021). In order for agricultural landscapes to function regeneratively, farmers must understand the interrelated and nested systems within the place they conduct their work in—precisely because it is these systems and places that will begin to regenerate (Haggard and Mang 2016; Soloviev and Landua 2016). Massey's relational theory can be used to understand farmers perceptions of relational dynamics between humans and nature within regenerative farming practices in their place-based context using the concepts of activity space, living structures, and thrown togetherness. In agricultural systems context, these concepts map the connections, localities, and relations between human and non-human actors within the farming ecosystem, provide the basis for understand how regenerative agriculture farms serve as a meeting place of human and non-human actors with different interests and ideas (Massey, 1995; Massey, 2005). This relational approach highlights the co-shaping and co-evolving dynamics between human and non-human actors in the ecosystem that is essential for regenerative landscape transformation.

#### 2.2 Ethics of care: An ecofeminist lens

This section explores the literature on ethics of care and argues that such relational lens is useful in understanding agricultural transformations. Fischer and Tronto (1990) have defined a care ethic as -

"...everything that we do to maintain, continue, and repair our 'world' so that we can live in it as well as possible. That world includes our bodies, ourselves, and our environment, all of which we seek to interweave in a complex, life-sustaining web (p.40)."

The core of this feminist theory is the concept of "more-than-humanism" which states that our reality is constructed by our communication with each other (actors within the ecosystem) (Collins 2015). The ethics of care was introduced by Gilligan (1982) and it highlighted "feminine moral development" through interconnected caring relationships as compared to "principle-driven" male moral process. It is emphasized that care is rooted in connectedness, mutuality, cooperation and trust, prioritizing relationships over competition (Popke2006). Beachem (2018) argues - "ethics of care framework serves to problematize hierarchical normative ethical frameworks - which place the human at the top or center - and instead proceeds with a vision of a horizontal web of interdependency between all matters". Care ethics characterized by relational and interdependent aspects challenges the "(neo)liberal principles of individualism, egalitarianism, universalism, and of society organized exclusively around principles of efficiency, competition, and a "right" price for everything" (Lawson, 2007, p.3; Moriggi et al., 2020a). Care has been proposed as an alternative ethical framework that revitalizes social connections and re-establishes social responsibility (Popke, 2006). A care ethic rooted in interdependence promotes equitable relationships across networks, challenging existing power imbalances (Seymour, 2022). Entities that are inculcating the "practice of attention and support, beyond conventional approaches- can contribute toward societal change through their interactions with others" (Conradi, 2015; Seymour, 2022). Krzywoszynska (2019) refers to this care approach as more-than-human ethics where the care for non-human lives also becomes a part of caring for human well-being. This ontological background is used in order to not exclude but include human and non-human actors, such as things, other animals, objects, organisms, physical forces, living beings, and spiritual entities. More-than-humanism embeds humans within a web of interdependent relations, deconstructing anthropocentric thinking and human exceptionalism (Strong, 2015). From the more-thanhumans perspective, the importance of culture and the knowledge of farmers, in understanding non-human agents such as soils, weeds, and trees are significant within agricultural practices. By doing so, I aim to draw upon local people's experiences of their interconnectedness with nature and social relationships. These cultural and social relationships are inherently place-based in which humans are situated in, co-constituting each other. A place-based ethics of care is an approach that combines environmental ethics, ecofeminism and experiential learning to foster empathetic relationships with humans, more-than human entities, natural systems within specific geographical context (Ryan et al., 2022; Goralnik, 2014). There are strong arguments for the connections between practices of care and processes of change (Seymour and Connelly, 2023). Using a place-based ethics of care approach, regenerative agricultural practices can be viewed as experiments where human beings are considered "response-able" for nature and can live interconnectedly with non-human actors while caring for them within their specific contexts (Duncan et al., 2021). Ethic of care and socio-ecological relationships are argued to intersect in a way which can provide beneficial and constructive ways for re-conceptualizing the traditional academic approach to transformational food politics (Moriggi et al., 2020).

#### 2.3 Conceptual framework: Place-based ethics of care

I am using place-based care ethics as conceptual framework to operationalize the research question aimed at understanding farmers' perceptions, experiences, motivations and concerns, their interactions with nature and the embeddedness of these relations within their cultural context. This framework emphasizes the interconnectedness and interdependence of all entities in a given place aligning with Escobar's (2001) argument that place is not a merely physical location but a web of relationships, practices and meanings. In this conceptual framework, I am using an integration of Massey's (1995) concepts of understanding place relationally through activity space, living structures and thrown togetherness and Tronto's (1993) care framework of care about, care for, care giving and care receiving (Figure 1).





The activity space, as mentioned represents farmers' farmlands, natural surroundings and community spaces. These are spaces where farmers can express what they 'care about' by being attentive and recognizing the need to care. This dimension is used to map farmers connections within more-than-human interactions in these spaces and understand farmers perceptions of current challenges with farming and the need for adoption of regenerative agricultural practices. Living structures provide the basis for understanding the type and pattern of connections within the activity spaces. This is coupled with the 'care for' dimension which is used to understand how the relations between human and non-human actors within more-than-human interactions characterized, and farmers perceptions of care and respect for more-thanhuman entities through their ideas, beliefs and values. Thrown togetherness highlights how regenerative farms and ecosystems can serve as a meeting place for human and non-human actors with different ideas and interests. This coupled with 'care giving' dimension is used to explore how human-nature interactions within regenerative practices, significantly influenced by traditional farming knowledge and cultural values, help shape identities, connections, and cultural contexts, which in turn co-constitutes the place. The last dimension of 'care receiving' is used as a feedback loop to understand how more-than-human interactions are shaping farmers perceptions of motivations, values and objectives contributing towards regenerative transformations of their mindsets and ecosystems.

I believe this framework can help identify and understand key factors that contribute to behavioural and mindset shifts towards regenerative agricultural practices. In the previous sections, I have discussed how some of the existing literature views regenerative agriculture as inherently relational and place-based. This implies that regenerative practices are manifested in ideas and morality of care that are deeply rooted in context specificity and localized ontologies. Hence it is justified to use a place-based ethics of care framework as an extension to ethics of care to explore farmers perspectives on more-than-human interactions within regenerative practices and how that contributes to a meaningful transformation not just of landscapes but overall ecosystems. While relationality helps identify dynamic interactions and relationships within a particular ecosystem/place, ethics of care provides a structured understanding of how interactions are guided by ethical care thoughts and practices elaborated in the case study explored in this thesis. The integration of these two theoretical frameworks into a place-based ethics of care conceptual framework highlights the significance of more-than-human actors in co-creating and sustaining agricultural ecosystems and the role of care in fostering resilience.

# Chapter 3 Methodology

#### 3.1 Introduction

This section outlines the thesis design, detailing data collection and analysis methods, and the methodology for drawing conclusions. The first section elaborates upon the scientific positioning of this thesis - ontological and epistemological framework that guide the choice of research tradition. The next sections focus on the research methods used to collect and analyse data. The last section of this chapter explains the ethical considerations and researcher positionality.

#### 3.2 Scientific positioning: Relational more-than-humanism, Constructivism and Post-Structuralism

This thesis positions itself within the scientific discourse by employing relational more-than-humanism as the ontological framework and constructivism coupled with post-structuralism as the epistemological framework. Relational ontology emphasizes that reality is fundamentally constituted by relationships and interconnectedness between entities, rather than by independent substances (Spyrou, 2022). Human social worlds are often more-than-human social world as they are composed of relations between human and non-human entities recognizing and identifying the agency of non-human actors (Bennett 2010; Whatmore 2002). Such a notion of relational more-than-human worldview breaks down the human/nature binaries and situates humans within an interdependent and interconnected paradigm, crucial for understanding the evolving socio-ecological relations (Panelli 2010, Booth 2013). More-than-human worldview acknowledges that both humans and non-humans are actors and have agency but, in this thesis, I have considered humans to be the primary agent of change and transformation. I believe, human relationships with non-human agents within our ecosystems must shift towards inclusivity and care. A more-than-human understanding can provide a wholesome interpretation allowing for a space to consider the influence of non-human agents in agricultural transformations. This thesis, that is essentially a study about environmental challenges, needs to be explored through a methodology that focuses on comprehending relations between human and environment. Therefore, this thesis is developed through the concept of 'constructivism' epistemology. Constructivism proposes that knowledge is purposefully constructed through interpreted meanings derived from social interactions (Graue and Karabon, 2012). This is coupled with a post-structuralist view highlighting that knowledge construction is shaped by culture, history, language and power relations emphasizing interconnectedness and relationalism (Sandu, 2011; Murdoch. 2006). A relational perspective on regenerative agriculture will help analyse the complex web of interactions and involved power dynamics integrally. The lack of such a systemic thinking is argued to encourage a myopic view on regenerative agriculture as defined by Western sciences that comprehends this philosophy as a set of practices, principles and outcomes. Hence, constructivism embedded in post-structuralist epistemologies within a relational more-than-human ontology offer a concrete framework in which the theoretical framework of relationality and ethics of care can be well situated. This scientific positioning has guided the choice of research tradition for this thesis, which is case study analysis, elaborated in the section below.

#### 3.4 Methodology

In this thesis, a case study analysis is employed as the primary research tradition to explore the transformative potential of regenerative agriculture in India, particularly through sociological dimensions. Since, the research questions of this thesis deal with human perceptions and experiences of care interactions, cultural embeddedness and their motivations towards transformations, it is justified to use case study as the research tradition. This is because a case study allows for an in-depth exploration of dynamic interactions and complex issues within farmers' real-life context, through documenting experiences (Durdella, 2019). The case chosen for this thesis is a group of tribal farmers inhabiting parts of Eastern Ghats (mountain range) in India who have decided to shift away from conventional farming towards regenerative approaches. The case study method facilitates a comprehensive understanding of the complex relationships

and dynamics that drive their agricultural decisions. The chosen geographical region is characterized by arid and semi-arid agro-climatic conditions. Agriculture in this region has evolved over centuries with the region being a centre for dryland agriculture and pastoral farming. The tribal communities have traditionally engaged in agriculture primarily for subsistence, growing millets, cereals and pulses. With the advent of modern paradigms, almost three to four decades ago, farmers started cultivating cotton and other cash crops with a focus on improving their livelihoods (Flachs, 2016). Through qualitative data collection methods such as in-depth interviews and participant observations, the study captures the perceptions, experiences and motivations of these farmers. The case study analysis provides rich, contextual insights into how regenerative agriculture can enhance ecological resilience, self-reliance, and community well-being. By situating the research within the specific socio-cultural landscape of the Eastern Ghats, the study contributes to the broader literature on regenerative agriculture by offering a detailed exploration of the interplay between human and non-human actors in landscape transformation.

#### 3.4.1 Sampling

This case study analysis was conducted using a mixed-method approach such as document analysis, semistructured interviews and participatory observation, to make visible the complex interconnections between farmers and non-human actors in regenerative farms in Eastern Ghats, India. In the beginning, I selected 3 villages in the Salur region of Andhra Pradesh, India with farmers engaging in regenerative agricultural practices. These communities of tribal farmers predominantly grow regenerative organic cotton while working with an organization named 'Grameena Vikas Kendram (GVK Society for Rural Development)'. I tapped into farmer networks for document analysis and informal interviews and used the snowball effect (Bryman, 2016) to further select the villages and farmers for data collection. I began my exploration with 2 team members from GVK Society who assisted me in accessing the farmers. I chose approximately 5-6 farmers from each village and I used a mixed-method approach for data collection. The research units selected include farmers, farming landscape, the village and associated organizations.

#### 3.4.2 On the field

During this research I collected data from farmers interactions and engaged practices through a mixed method approach.

#### 3.4.2a Semi-structured interviews

First form of data gathered through conversations with farmers was in the form of semi-structured, in-depth interviews. This method, frequently used in qualitative research, consists of conversation between a researcher and participant(s) guided by a flexible interview blueprint spanning approximately 30 minutes depending on the attention span of the concerned stakeholder (DeJonckheere & Vaughn, 2019). Farmers were interviewed around certain themes associated with the research questions. In this thesis, I conceptualized participants' thoughts, feelings, and beliefs on relations between human and non-human actors within the regenerative ecosystem and how understanding dynamic interactions contribute towards transformative mindsets. This allowed me to collect open-ended data and understand deeply personal perceptions. The interviews were held on the farm ensuring the surroundings (non-human actors) could also play a role in the interviews.

#### 3.4.2b Participatory Observation

Second form of data collected was through participatory observation. The researcher walked through and in the surroundings of the farming landscape, taking field notes of her observations. The researcher also noted and recorded digital data that was obtained on the field through some informal conversations with other participants such as farmers, village heads or other family members of the household.

#### 3.5 Analysing data and expected outcome

After the data collection through a mixed-method approach, data was analyzed to draw insights and conclusions. This analysis of data resulted in data conceptualizing and development of hypotheses which was informed by place-based ethics of care framework. The findings or hypotheses was in the form of key

themes emerging out of farmers' perceptions of human-nature interactions and relations embedded within regenerative agricultural practices. This further informed the insights reflecting on what farmers think, care about, are motivated towards and how they make certain decisions for their ecosystems' health and landscape transformations. The expected outcome was to synthesize key themes that emerged out of data analysis (obtained from engagement with the farming communities practicing regenerative agriculture) that are contributing to transformative mindsets and behaviours.

Data collected in the form of recorded transcriptions from the interviews were analysed using inductive 'coding'. Qualitative coding of the data systematically categorized the excerpts to find themes and patterns making the analysis more rigorous, also providing reflexivity to the researcher. Since the research was operationalizing the data using a relational lens and a more-than-human care approach, thematic analysis of coding helped identify patterns in the data to derive meaningful themes. To conduct inductive coding, I used a ground up approach. First, the unstructured or semi-structured data in the form of in-depth interviews was translated and transcribed while actively observing emerging patterns and themes. Then an initial set of codes was created, meaning the first layer of categorization was done (code) for the excerpts as observed in the data. After this, excerpts belonging to the same code were grouped together. Once the codes were set, they were grouped further into themes which were later merged with an aim to form a narrative. This narrative represented the complete story of the data.

#### 3.6 Researcher positionality

I am a student at Wageningen University pursuing my masters in development and rural innovation. I have a diverse professional experience in terms of roles I have fulfilled and industries worked with. This has contributed to developing my passion for food sustainability and socio-ecological resilience.

I hail from a region that is close to the location of the research and I am able to understand and speak the regional language (Telegu) proficiently. Although, I consider myself to be an outsider and acknowledge that my realities and identities are different from the observed stakeholders such as farmers. This implies that the research has to be considerate of these differences. I was working with a local project manager who helped me get access to the farmers and also translate the parts where I was not able to understand certain parts of the dialects spoken by the farmer. The local manager also helped me deal with any kind of felt power dynamic hindering farmers' participation. I was well aware that sensitivities needed to be kept in mind while engaging with the stakeholders. I aimed to give as much agency and space to the participants involved in the research so that they feel empowered enough to share their thoughts, perceptions, critiques and comments regarding the process and design. This not only served as feedback for the thesis but also ensured their effective engagement with the thesis, with a sense of ownership. Since socio-ecological and relational dimensions to understanding regenerative agriculture are new concepts explored in academia (especially in India), I as a master student believe that this research can substantially contribute to the academia and motivate future researchers enough to delve into exploring regenerative agriculture through relational dimensions to understand the true essence of transformation.

#### 3.7 Ethical considerations and result sharing

Ethical considerations were made throughout the entirety of the research process

#### 3.7.1 Pre data collection

Since the research area fell under code yellow as per the travel restrictions by the government of Netherlands, I took permission from the University through a form to conduct my field research. I also shared the data management (storage and sharing) plan with my supervisor before starting the field work.

#### 3.7.2 Data collection & storage

I was careful in taking all kinds of precautions and measures to avoid any ethical conflict during the data collection phase where I was observing the farmers, talking to them, and recording the interviews. All the data collection was done only after receiving consent from the participant. Additionally, I ensured

transparency regarding the aim, objective, research questions and the design of the research with the participants. I gathered written or recorded verbal consent from the participants regarding interviews, participant observation and recording of their voices and actions. This was done in discussion with the participants to maintain transparency regarding the research usage and distribution. Researchers' contact was also made available to the participants furthering the legitimacy and accountability. Data collected was securely stored. However, the storage plan was not shared with the participants farmers but shared with the partner organization.

#### 3.7.3 Result sharing

Once the research is completed the results will be shared with the farmers and other researchers in the form of a written document with understandable insights and recommendations through the partner organization (GVK Society).

## Chapter 4

# Farmers regenerative practices – a blend of traditional knowledge, cultural beliefs and contemporary approaches

#### 4.1 Introduction

This study's primary research question explores the farmers perceptions of their interactions with human and non-human actors within their ecosystem through regenerative farming practices. The field study was a means to understand the feelings and thinking of farmers who have adopted 'regenerative' approaches. It delved into their practices, beliefs, values and motivations to gain insights into their experiences and perspectives. This chapter will focus on unpacking the findings obtained from the data collected through indepth interviews and overall observations. The findings of this study have been categorized into 4 themes – farmers intuitive regenerative practices, role of traditional farming knowledge in informing the practices, cultural beliefs embedded within the practices and farmers' narratives of change and transformation. This chapter will elaborate upon the first three themes and the next chapter will focus on the narratives of change. Understanding these themes as experienced by the farmers through various practices will help in comprehending their perceptions of complex relationships and dynamics within their regenerative ecosystems that drive their decisions towards transformation.

#### 4.2 Farmers intuitive 'regenerative' practices

The farmers in the study are predominantly cotton and maize producers who have shifted from conventional modern agricultural practices to adopting (regenerative) practices for the betterment of their soils and lands. The first theme emerging from the field study data highlights the practices adopted by farmers. These practices align closely with current discourses on regenerative agriculture, embodying its core principles. However, these farmers are unfamiliar with the term 'regenerative agriculture' and its associated text-book definitions. For these farmers, their adopted approach is a synthesis of scientific methods introduced by various organizations and traditional farming knowledge passed down through generations. This integrated methodology combines modern agricultural science and time-honoured practices reflecting a blend of innovation and heritage.

One of the practices characterizing farmers shift towards regenerative agriculture is the reduction or total elimination of chemical inputs on their farms. The majority of study participants have either reduced their use or entirely stopped the application of fertilizers, pesticides and herbicides in their agricultural practices. They have substituted synthetic inputs with in-house natural concoctions prepared by them using cow urine, animal manure, and other plant products which are available in abundance within their environment. By reducing reliance on external chemical inputs and deciding to prepare their own inputs, farmers have demonstrated value for ecological well-being, economic resilience, self-reliance and empowerment.

"We **make our own medicines** for the crops. Ganajeevamrutam, Jeevamrutam and Panchagavya are the names of these concoctions. They are **made primarily using cow dung, urine, neem leaves, gram flour and jaggery**. Also, **we use toddy from cashew plants, yogurt, banana** along with already mentioned materials to prepare different mixes. **We do not buy any of these materials from anywhere since we grow most of them** and avail some from our animals. Although it takes time to prepare these concoctions, but we **do not have to spend any money to buy from outside** and also makes us self-reliant. This definitely makes us empowered."

These farmers also tend to place high value on soil health and biodiversity. They show keen attentiveness towards observing the changes in soil texture, microbial population and overall health to gauge the transformation caused by the new practices adopted by them. They have identified an increase in the population of earthworms and other microbes. Through observation of soil textures, farmers have noted an enhancement in the water absorption capacity and circulation of air within their soils owing to the increase in the earthworm and microbial population in the soil. They also observe that the quality of yield of the crop grown through adopted new practices is better as compared to how they used to grow earlier.

"The microbial health of the soil improves a lot when we do not add any chemicals. Similarly, the population of earthworms that are crucial for aerating the soil has increased stupendously in the absence of chemicals. Circulation or air and absorption of water has also increased due to the traditional farming practices. The overall resilience of soil and crops has increased since I shifted to traditional farming practices."

In addition to observing the improvement in soil health, farmers have also witnessed an improvement in the quality of their own personal health after reducing or stopping the application of chemical inputs. They share that caring for their family's health along with their farmlands is a strong motivation for them to shift to regenerative farming practices.

"Not using any chemical inputs to grow crops that we eat will be healthier for us overall. This is what I like the most. I observe that **our bodies now are not as resilient as they used to be earlier**. This is **because of eating traces of chemicals** that are stuck on the crops. I **am motivated to provide healthier and nutritious food to my family and community and therefore, I shifted to natural farming**."

"Because of my experience and experiments with regenerative farming, I have not gotten my health problem in the last 5 years. I only use natural medicine even for my kids. We do not need to visit a doctor thankfully."

The other regenerative practice that many farmers have adopted is intercropping where they plant numerous regionally-appropriate crops within the same plot along with their main crop (i.e., cotton or maize). To put this into perspective, farmers have mentioned about growing millets, a few kinds of pulses, vegetables, nuts and flowers along with cotton. They perceive intercropping as a symbiotic relationship between all the biological actors involved within this practice. They mention that the intercrops help replenish the lost nutrients in the soil for the main crop, attract cross-pollinators and pests such that the main crop is protected, offer the farmers with food for subsistence and sometimes as alternative sources of income.

"The intercrops help replenish the nutrients required by cotton in the soil. Additionally, they also help in attracting the pests away from cotton. Also, I personally believe that we should grow crops that used to be grown earlier as I have an affection towards traditional practices. For example, "We grow peanuts along with cotton. Peanuts help enhance nitrogen elements in the soil which helps improving soil health and give nutrition to Cotton. Similarly, we grow castor and marigold along the border of cotton farm that helps attracting pest which otherwise would have landed on cotton."

We do intercropping for subsistence and sometimes for alternate sources of income. Also, Intercropping keeps the ecosystem of the soil alive."

Since these farmers own smallholdings, they are consistently under financial pressure struggling to make their ends meet on an everyday basis. Better livelihoods and quality of life is something they aspire for and also care about. Growing crops for subsistence along with their main crop helps them take care of their soils and lands and provide them with quality and nutritious food to eat. Sometimes, the yield from intercropping also provides them with alternative sources of income depending on the type of crops grown. The farmers have identified the relational aspect of these processes in terms of how interactions between human and non-human entities within their practices affect their health, livelihoods and also has a positive impact on their environment resulting in overall transformation of the ecosystem.

#### "Firstly, we need to eat and hence we need to grow some crops for subsistence. These crops can be millets or lentils which is the staple food in this region and can be grown as intercrops. If we need financial stability, we can grow intercrops such as cashew, tamarind, mountain broom, custard apple etc. These crops do not need any chemical inputs or seeds to be sown every year...

The farmers in the study have shifted from modern agricultural methods to practices such as no/reduced use of chemical inputs, using natural mixes for plant growth and pest attacks, intercropping and crop rotation for the betterment of their soils, crops and themselves. They evidently recognize how the adoption of (regenerative) practices can catalyse a transformative shift in their ecosystem by enhancing soil health,

biodiversity, resource efficiency and overall farm productivity along with socio-economic and ecological resilience. As expressed by several participants, they realized their need to give regenerative practices a fair chance on their land knowing it is the best for the overall well- being. However, they also acknowledge the challenges involved which have been explored further in the next chapter.

"Knowing that it is the best for us and our land, if we have used chemical fertilizers when they were introduced, why not experiment with natural ways again."

"We need to give our farms a chance for multiple seasons. One of my friends tried to grow one kind of millet but because of untimely rains, the saplings did not come. After that, no one is willing to experiment for another season. What I believe is that we need some kind of safety net to be able to perform such experiments which can instil confidence and motivate people to go back to traditional farming ways which are regenerative in nature."

#### 4.3 Role of traditional farming knowledge in informing adopted practices

Traditionally, the farmers in this region cultivated crops entirely through natural and regenerative methods, primarily for subsistence. The advent of modern agriculture led to a shift towards monoculture models of commercial crops resulting in loss of traditional farming knowledge. However, some participant farmers, particularly from the older demographic, have preserved some aspects of traditional knowledge, especially regarding native and local crops cultivated by previous generations. These farmers emphasize the need to recover lost traditional farming knowledge and revert to time-honoured practices to achieve holistic agriculture benefitting all stakeholders of the ecosystem.

#### "... If we have to grow our crops properly, we need to gain our lost traditional knowledge back ... "

The study farmers emphasize traditional farming knowledge embodied in practices such as chemical-free cultivation, intercropping, growing native crops and natural seed breeding. One of the farmers particularly points out how traditional wisdom has informed their intercropping practices recognizing its benefits for soil, crops and communities. The farmer highlights how their practice of intercropping exemplifies a blend of traditional knowledge and guidance from organizations based on modern scientific approaches.

My parents and grandparents always had 5-6 crops growing on the same farm. They were strong believers of intercropping. This in a way provides security in the sense that if one crop fails, there is a chance that the different crop will survive. Also, it provides nutrients to soil in cyclic ways. Drawing inspiration from that, I have also begun to grow 2-3 crops in my farm along with cotton and maize. Few organizations told me about certain crops that can be easily grown without any chemical inputs and also give us good prices in the market. For example, tamarind, shikakai, red gram, custard apples, coffee etc.

Traditional farming knowledge in the Eastern Ghats region is also exemplified by the cultivation of native and local crops, particularly millets, that have been integral to the agricultural landscape for thousands of years deeply rooted in local farming traditions and cultural practices (Singh et al., 2013, Soumya K et al., 2023). They were locally called 'Satyam Pantalu' meaning 'crops of truth' as these crops grew without any inputs on highly infertile lands (Singh et al., 2013). The study findings identified that traditionally farmers were growing indigenous millets and pulses for their drought-resistance, suitability for the agro-climatic conditions of the region and their high nutritional value. Emphasizing the value of millets in sustainable agriculture, one of the farmers shared the benefits of growing millets and pulses by everyone in the community highlighting its role in improved personal health, increasing resistance to pest attacks and land fertility. This traditional practice is ingrained in values of ecosystem well-being, connectedness within the community and self-reliance.

"The **millets** have **existed since my parents and grandparents' times**. Them and **the entire community use to grow** in the fields. The grown millets **were used for subsistence** of the village. Generally, the **crops during that time were resilient** as the land was extremely fertile and good. Even if there was a rare case of pest attack which led to a lot of damage, since everyone was growing similar crops, there was always sufficient *for people to survive and eat without borrowing money* or depending on anyone else. *Lands fertility* also grew because they use to grow multiple and different crops throughout the year. Also, the *soil ecosystem was healthy............*"

# *"......To restore what we have lost, we have been trying to get back to traditional farming by experimenting in small parts of our fields* to mitigate the risks involved."

Few farmers also highlighted that they have started growing millets and pulses while applying traditional knowledge of seed breeding for these crops. This approach not only fosters self-reliance but also strengthens their connection to ancestral agricultural methods. By leveraging the traditional expertise, farmers aim to improve the resilience and sustainability of their farming systems.

"A lot of millets and lentils were grown earlier here. We have started to grow these crops as well in traditional ways, we do not use fertilizers. We grow these intercrops **from the seeds that we have bred in a completely traditional and natural way....**"

The participant farmers in this study have acknowledged their need to go back to their roots that were predominantly based on the value of togetherness and ecosystem well-being. Shifting away from modern extractive practices, farmers have been revisiting their traditional farming knowledge through adopted practices on their farms. They are able to do so with the help of some older and experienced farmers in the community and a few organizations that provide trainings on methods and practices based on a blend of traditional wisdom and modern scientific approaches. It has been identified that traditional farming approaches are not limited to a mere set of practices for farmers but is a holistic concept where they feel connected with nature learning about their ecosystem and how every actor within lives in mutually beneficial relationships.

#### "So, traditional or natural farming for me is not just about not using chemical inputs but is much more. It is more like philosophy for me where I learn about my surroundings and different members of this ecosystem. I get to learn about how plants, animals and humans can live in harmony helping each other to sustain happy, healthy and resilient lives."

Many farmers in the study have realized how the more-than-human relationships have helped co-shape and transform their landscape from a monoculture site of production to symbiotic regenerative systems. Understanding farming at an ecosystem level has enabled these farmers foster a sense of responsibility to convince other farmers associated with conventional agriculture to revert to traditional farming practices.

"I am trying to convince people from mine and nearby communities to go back to traditional practices of growing native or local crops such as tamarind, cashews, custard apples etc. which are more suitable to grow on our soils, can be grown well with just the rainwater as they are not water intensive crops unlike maize. They need not be grown with the help of chemical inputs and can be used for our own subsistence as required. Few people are coming forward to learn more about this but most of them hesitate to change their ways due to the fear of risk. I, with the help of some other people from organizations, are trying to tell the community members how we could grow different crops within our farms which can be sown once and then for the next 5-6 years we do not have to do much since these crops grow by themselves every year. It is more like an agroforestry project which gives Farmers a diverse income source, keeps their farms and soil healthy, rich and resilient and also provides them with good quality yield that they can sell in the market at good prices."

Farmers have expressed this feeling of responsibility through their willingness and eagerness to openly share and communicate the best practices and knowledge about native crops, natural concoctions and other traditional approaches to farming with the rest of the community. They believe that encouraging farmers who are engaged in conventional agricultural practices through knowledge sharing will help boost overall well-being of the ecosystem. "Interviewer: **Do you feel responsible to pass on the knowledge** of best agricultural practices that you follow to the rest of the community?

Whatever I am doing, I want to **teach this to others to grow crops in traditional ways**. I am trying to teach people as much as I can. People also respond well. Not because I am an elder person but **because they can see what I do in my farm, it is easy for them to believe in my processes**. For example, I mix some sort of waste in cow milk and use it on my farm which helps me protect the land from weed growth. People have seen this and hence trusted these processes."

#### 4.4 Cultural beliefs embedded or need to be re-embedded in practices

Going beyond the values of ecosystem resilience, socio-economic sustainability and empowerment which are considered to be strongly linked to their agricultural practices, farmers view their farmlands as a maternal figure stemming from their cultural belief establishing a strong connection between them and the nature. This relationship is understood as personal, reciprocal and mutual similar to the perceptions of human-nature interactions within their practices.

"Our farmland is like our mother. And we all would love to take care of our mothers right."

"The **earth is our mother** who bears the entire world. The **way our mothers protect us and we look after them, earth also protects us the same way**. That is why we farmers believe that even if the majority of the crop is lost, even one sapling is enough for us to survive. Rest the mother earth will take care of us no matter what..."

The tribal farming communities in this study, exhibit a profound spiritual connection to their environment by personifying natural elements such as rain, forests and animals as deities or guardians of the communities. They engage in various spiritual rituals and practices that are performed to ensure good yields, personal safety and prosperity.

"we strongly believe in our rituals and **celebrate all the festivals**. That is spirituality for us. We **do not touch our crops without celebrating these festivals** or offering our yield to gods. The **seeds** we use to sow are **blessed by the gods**. We **need to recognize** that through our festivals **such that it gives us good yield**."

It can be contested that such beliefs are typically human-focused operating on farmers' personal gains. However, the study findings have identified that a few farmers' concerns have expanded beyond personal well-being and crop productivity and recognize the importance of overall ecosystem health and resilience.

"Early in the morning I leave for the forest. There I **worship a rock, a tree, an animal** etc. to **ensure that my ecosystems stay healthy and resilient**...

These beliefs and values are also demonstrated through farmers' bond with animals. Their interactions with animals within their farming practices fosters an understanding of the significance of animals within the broader ecological paradigm. These relational bonds highlight interconnectedness and a sense of care as experienced by the farmers.

"We have to go through forests to collect some resources and our farms are a bit far away on the hill. **Every** day when I go to the farm, this dog accompanies me throughout the way and comes back with me in the evening. It protects me or alarms me of any danger on the way. In a way, this dog is my safeguard. This means that I am able to do farming and run my household because of this dog. This is why it is extremely important to me. I as a farmer care about every member of my ecosystem. This dog symbolizes what I care for."

Cultural beliefs and values coupled with traditional farming knowledge reinforces farmers' connection to their environment promoting human-nature interactions of reverence and mutual relations. Such connections to lands stemming out of traditional cultural beliefs underpins resistance to capitalistic forces and modern agriculture for a few tribal communities as expressed by one of the study informants.

"There are villages much higher up the hill where they only do traditional agriculture. They only grow millets and other native crops purely for subsistence. They are aloof from the modern urban influences and have their own cultural and traditional system. The entire community works and sticks together following the same agricultural and livelihood principles. They are way healthier and more resilient than our communities".

The traditional values and practices emphasizing living symbiotically with nature in harmony makes farmers view farming as a **"way of life"** and not just a mere occupation. Associating their belief systems with their adopted agricultural practices have nurtured a sense of care and responsibility strengthening their identities as custodians of their lands, community and cultural heritage.

"Farming is a way of life for us. We have a defined set of practices that we follow. We also got trained on how to prepare natural concoctions that would help the crops against pests. Farming is our livelihood but it also is a way that keeps us in sync with our nature and ecosystem."

The participant farmers in this study have elaborated upon the ill-effects of modern agricultural methods on their lands, communities and overall eco-system which prompted them to adopt farming methods that are more integrated with nature. Farmer's decisions to adopt regenerative agricultural methods signifies a pivotal shift towards restoration and regeneration of degraded lands incorporating both physical rehabilitation and emotional reconnection. These farmers recognize the value of working in harmony with natural processes rather than dominating them. The adopted practices have emerged out of farmers relearning and re-appreciation of traditional knowledge and cultural beliefs that are place-based and contextual to the region.

#### 4.5 Conclusion

This chapter has elaborated upon the findings related to intuitive practices of farmers, the role of traditional knowledge in informing these practices and the cultural embeddedness of these practices. This section highlights the key findings from the synthesis of results so far. First key finding relates to farmers decisions on implementing practices that are based on using resources available within their ecosystem emphasizing the significance of region-specific knowledge and responsible resource management linked to their values of empowerment and self-reliance. The practice of preparing natural concoctions using plant and animalbased materials available within the ecosystem instead of chemical inputs and the decision of growing native crops or other crops suitable for their agro-climatic conditions for intercropping exhibits their place-based understanding. It also highlights the importance given to the values of self-provisioning and autonomy. The second key finding relates to revisiting, re-appreciating and re-learning traditional farming knowledge and embedding it into their intuitive regenerative practices. This has enabled the farmers to witness connectedness within human-nature and human-human relationships and experience continuous and conscious loop of reciprocity between the actors within their more-than-human interactions. The third key finding relates to how cultural beliefs together with traditional knowledge and practices have strengthened farmers connections with their lands and ecosystem fostering a mindset that view farming not as an occupation but as a 'way of life' that focuses on harmonious and mutually beneficial relationship with nature. This has also reidentified their role as change makers and land stewards responsible for taking care of their ecosystems well-being by adopting good practices and encouraging other farmers towards a regenerative transformation.

## Chapter 5

## Narratives of change and transformation

#### 5.1 Introduction

Adoption of regenerative practices by the farmers highlights a significant shift towards holistic farming and transformation at an ecosystem level. What practices have been adopted, how they are informed by traditional farming knowledge and cultural beliefs and values and how they contribute to agricultural transformation has been discussed in the previous chapter. But any transformation comes with its own challenges. This chapter aims to explore farmers narratives of change and transformation by understanding their perspectives on challenges involved in adopting regenerative agricultural practices. To comprehensively understand the transformative potential of regenerative agriculture, it is important to recognize and comprehend farmers perceptions of transformation in terms of their motivations and values. This chapter will also discuss the opportunities identified by the farmers that could potentially catalyse a shift towards regenerative agriculture.

#### 5.2 Monetization of agriculture: Neglect of ecosystem for profit

Several farmers in the study mentioned that higher caste groups persuaded farming communities to abandon traditional methods and shift to conventional agriculture driven by the monetary appeal of modern farming practices. This encouraged the farmers to focus exclusively on monoculture of commercial crops, rapidly increasing yields through chemical inputs to maximize profits. The farmers recognize that this profit-driven transition has not only degraded the landscape but also cultivated an exploitative mindset towards agriculture and the environment.

"the current generation thinks basically in terms of yield. They want to **maximize the yield** at any cost. This leads to an **ignorance towards soil and ecosystem health**. In a nutshell, the youth farmers' **thinking towards farming is extremely narrow and extractive** in nature"

"Farmers mostly are looking for **making more money**. The **financial need has become paramount** for almost everyone and thus **Farmers are falling prey to methods that promise to give them more financial returns without weighing the pros and cons** of those practices."

The transition to profit-driven agriculture has also triggered migration of young farmers to urban areas in pursuit of more lucrative opportunities as they believe traditional farming cannot fulfil their financial aspirations. Research participants have highlighted how Western capitalistic influences have altered community aspirations, encouraging consumeristic and exploitative mindsets that prioritize short-term gains over long-term sustainability. This change in perspective has prompted farmers to adopt shortcuts and profit maximizing strategies at the expense of environmental and social considerations. These factors collectively act as barriers to adopting transformative agricultural practices prioritizing long-term sustainability and ecosystem health.

"Most of the people of my age from my community either **want to practice modern agriculture using chemical fertilizers and growing commercial crops to make more money** or they **migrate to cities** as they believe labour work there is more lucrative than farming in the villages"

"Also, the **aspirations of everyone** in the current generation including you and me **have changed** and **driven towards consumeristic ideas** where people want more and more things without thinking about whether they actually need them or not. All this requires **money** which pushes them to become **extremely money focused instead of focusing on the overall well-being** of the community. I strongly feel that the **influence from the foreign countries has led to this shift** in the practices and mindsets of people. This is why people also have shifted to cash crops like cotton and maize." The findings identify that the paradigm shift in agricultural methods and resulting mental transformations among farmers significantly challenge reverting to good agricultural practices that integrate traditional farming knowledge with contemporary approaches for holistic ecosystem transformation.

#### 5.3 Vanishing heritage: Loss of traditional farming knowledge

This paradigm shift has not only altered farming techniques and mindsets but also eroded the traditional knowledge that was based on integrating human activities with natural ecosystems. Farmers in this research highlight a profound disconnect between humans and nature attributing to introduction of modern agriculture. They observe that many farmers in the community have lost touch with traditional farming practices, including knowledge of native crops such as millets and lentils, indigenous seed breeding techniques and time-honoured soil preparation methods. This loss extends to traditional socio-ecological wisdom crucial for maintaining ecosystem health. The prevailing mindset now perceives humans as separate from, rather than integral to, their ecosystems. Consequently, most farmers in the region have become detached from their roots, losing connections with their native land, livestock, and the bonds within families and communities. Such a transition substantially hinders returning to more sustainable and holistic agricultural practices.

"Traditional knowledge could not be passed on since it got lost with the introduction of modern agricultural methods such as using chemical fertilizers. Also, the current generation doesn't seem to be interested in farming per se as they find occupational opportunities in the cities more lucrative. So not many people in the community are interested in reviving the traditional agricultural knowledge."

"...Once cash crops were introduced, all the traditional **methods vanished since farmers were compelled to buy hybrid seeds** from outside along with the guidance of using chemical fertilizers to obtain maximum yield. **Our traditional knowledge regarding millets, lentils, vegetables and other crops production and seed breeding has been lost** since the advent of commercial crops..."

#### 5.4 Prioritizing individual decision over community interests

The introduction of conventional agriculture has displaced the community-centric approach to a more individualistic mindset, where farmers now make decisions independently. Unlike the past, when the community would collectively decide on farming methods, everyone now pursues their own paths. This lack of communal alignment is considered to be a significant obstacle to transformation owing to differing motivations, values, and aspirations that have fragmented the once united community.

"These days, each man is to himself. Most of the families work on their farm by themselves unless extra labour is needed on the farm. The decisions taken are all individualistic. The community doesn't work together as it used to in previous generations. Community gives a sense of belonging and is extremely important as any change that needs to be brought, can be done easily if the entire community works together. Unfortunately, that is not the case these days. When we are united, the well-being of the community is taken care of in a much better way and the community is empowered. But people do not understand this much these days."

"Right now, every Farmer decides for his/her own farm as an individual. Earlier, the community used to live predominantly as one big family but now thinking has become nuclear. People want to do things independently which also makes the transformation towards better agricultural practices difficult."

In addition to the abovementioned transitions, farmers highlight other barriers to adopting regenerative practices, including financial constraints, political inefficiencies, limited market access for native crops, and pressure to use hybrid seeds. These factors collectively impede the potential to shift towards regenerative agricultural transformations (Table 1).

Table 1: Farmers testimonials about barriers to transformation

Ουοτε	EXPLAINATION
"the traditional knowledge that was possessed by previous generations has been totally wiped out. I think that it is all the government's fault. For many decades the government kept encouraging people towards modern agricultural practices without reflecting on what will happen to the soils, farms and the farmers in the long run. Every other stakeholder in this value chain is working for profit at the expense of a Farmer's life. For example, the government or private companies force us to buy seeds from them every year and keep emphasizing on how we cannot breed our own seeds."	Farmer is highlighting how political inefficiencies have a siloed vision with a one-size fits all approach. The farmer also expresses how Western capitalistic ideas have influenced motivations of all stakeholders in the value chain due to which farmers, who are the most vulnerable stakeholder, get impacted negatively. The farmer hints at marginalisation of their knowledge and identities which makes them powerless.
"the lobby for chemical fertilizers is very powerful and is backed by the government. For example, cigarette packets warn us that it is harmful for our health, but the government encourages us to provide licenses to grow tobacco and sell them as cigarettes to people. Similarly, the fertilizers companies are very powerful since the government supports them and believes that chemical fertilizers do improve farmers livelihoods despite knowing the cons of it."	The farmer demonstrates a thinking or knowing of the world that is beyond their ecosystem regarding how politics at governmental and business organizations level hinders them from adopting good practices.
"we can grow millets on our farm but that will be only for our subsistence. If we sell, <b>we will not</b> get any profits since we do not get a good price for that in the market"	The farmers highlight the absence of support systems that could encourage them towards an agricultural transformation.

The realization of an urgent need to shift towards eco-system-based farming is evident from the motivations and values of the participant farmers who are on their journey of re-establishing regenerative methods. However, they have identified serious challenges to achieve such transformation at a wider scale which are primarily rooted in the mental transitions within communities. Exploring farmers perspectives on transformation and change further, the next section will elaborate on the study findings that reflect upon needs and opportunities as identified by the research participants that can potentially accelerate transformation.

#### 5.5 Collective action, effective communication and holistic approach towards transformation

The research participants identified several key elements crucial for bringing about agricultural transformation. According to study findings, one of the most prominent aspects necessary for this transformation is collective shift in mindsets towards holistic values and motivations stemming from long-term thinking. Additionally, collective implementation of good agricultural practices incorporating traditional farming knowledge was considered essential. These elements are seen as fundamental in fostering a comprehensive and sustainable agricultural transformation.

"The shift to traditional agriculture practices is possible only with a systemic change where everyone from Farmers to middleman, to big companies and to end consumers have a behavioural shift towards holistic production of food from a sole focus on profits."

"If we want to be in good health, we must switch to traditional practices of agriculture. To take care of our soils and our bodies, we must grow crops without any external chemical inputs. Shifting to traditional practices and regenerative farming will reduce the yield a bit in the first few cycles but it will also enrich the soil in the longer term. I agree that fertilizers help give good yield in a much lesser time which gives Farmers an opportunity to grow crops for one more cycle. But this benefit is short term with long term adverse effects."

The strong belief in the power of collective action as a crucial element for effective transformation is furthered by an anecdotal example shared by one of the study informants which illustrates the value of community connectedness. This example shows how connectedness manifested in collective action can drive effective agricultural change.

"If everyone who owns a farm in this village grows millets, lentils, vegetables entirely on their farms, birds who come in search of food get spread out to all the farms and eat a little from each farm causing little damage. But if it is only me who begins to grow these crops, birds will attack only my farm and therefore, all my produce gets wasted. If we act together, we are more powerful. Whatever hardship we face, if we are united, we can get through it easily since capacity is multiplied"

Farmers also recognize the profound value of empowerment and sense of belonging stemming from strong community connections. They firmly believe that well-being of ecosystems can be achieved when the community acts collectively. They further highlight the need to revive the communal bonds for a regenerative transformation.

"Community gives a sense of belonging and is extremely important as any change that needs to be brought, can be done easily if the entire community works together. Unfortunately, that is not the case these days. When we are united, the well-being of the community is taken care of in a much better way and the community is empowered. But people do not understand this much these days."

Elaborating further upon the need for collective action, one of the farmers emphasized the importance of community-wide behavioural shift towards producing and consuming nutritious food like how it was done a few decades ago. They suggest that the true transformative potential of traditional farming practices can be realized when the entire community collectively engages in experimentation and adoption involving multiple stakeholders. This collaborative approach is seen as essential for rediscovering and implementing sustainable agricultural methods that benefit both personal health and the environment.

"To reverse our ways, it will require hard work. Our ancestors have provided nutritious food to us and given us a resilient and healthy life. But **now what people eat isn't nutritious** nor keeps our bodies strong. This **needs to be realized across communities**. We as **farmers must come together with the support of a middleman to experiment for a year or two with growing millets and lentils**. Once this experiment takes place, **people will realize the true potential of traditional farming methods**."

Farmers stress on the crucial role of effective communication in motivating and encouraging their peers to adopt regenerative agricultural practices. They emphasize the need of highlighting the cost-effectiveness and empowering aspects of these methods. However, they mention that mere words are not sufficient for behavioural transformation. The communication needs to be action-oriented where conventional farmers can learn directly from those already on a sustainability journey. This approach highlights the relational nature of behavioural change asserting the significance of building trust to facilitate mindset shifts.

"We should properly communicate to our community people about the traditional farming practices and its benefits. What I mean is that we must show the benefits to them by doing it ourselves. We must let them know how empowering it is to get involved in these practices and how cost efficient it is overall. People need to see and believe. For behavioural transformation, only words will not work. The communication has to be action oriented. We need to build their trust for them to change. In my

# community **I think people are willing to change but they need to see and believe** the regenerative farming practices working on the farm."

Farmers in the research also underscore the importance of multi-stakeholder communication in promoting holistic agricultural practices. They express the need of inclusive dialogue involving all relevant stakeholders to persuade conventional farmers move towards regenerative approaches.

"Whenever I come across various people from different organizations, I request them to conduct meetings and come together with farmers like me to communicate better to people the benefits of traditional farming practices and local crops. If I try to do this all by myself, people do not pay much heed saying that I myself have not experimented with these practices enough. But **if different stakeholders, including the sarpanch** (village head), middleman, and may be government officials get involved in this communication with the farmers of this community, there is some scope for change."

Highlighting further the importance of effective communication, the participant farmers have demonstrated a sense of responsibility towards helping their peers feel motivated about traditional farming approaches and get in touch with their values.

"For example, in our district, **We are trying to hand pick farmers and hand hold them while they shift to traditional farming**. I hope that **this will help other farmers to get motivated**. I see this as a **chain reaction**. I show a farmer who owns much more land than me, how I am reaping benefits against the risks I am taking. This helps the Farmer to experience the benefits much more clearly and thus results in them shifting to regenerative farming practices. I believe the way we communicate has a huge role to play in motivating the Farmers towards traditional agriculture and regenerating our lost knowledge. Currently this communication is lacking as not every stakeholder gets involved as a team."

The urge to bring about agricultural transformation can also be witnessed in the innovative ideas shared by the participant farmers.

"One more idea to bring about a change is that I can sell my food produce directly to another Farmer who buys their food from the market. This lets them taste what I have produced using regenerative farming which is much tastier and healthier to eat. This experience can also help them shift to regenerative farming aspiring to produce similar quality produce."

Going beyond collective action and effective communication, farmers advocate for various other strategies that could potentially catalyse widespread transformation across communities. These strategies include providing financial safety nets and support and developing conducive markets for native crops. The farmers also emphasize on blending traditional knowledge with contemporary scientific approaches to encourage local seed breeding using traditional knowledge instead of coercing farmers to buy hybrid seeds. In essence, the farmers reinforce the notion of contextualizing the solutions that could help accelerate regenerative transformations by thoroughly understanding the underlying place-based relationalities and connections within the local context (Table 2).

QUOTE	EXPLAINATION
"I believe, giving financial safety nets and alignment within the community is important for the change to happen." "We need to be given financial security and safety nets for us to shift to regenerative farming completely."	Farmer is highlighting financial safety nets as one of the ways to get support. Since most of the farmers are smallholders, live hand-to-mouth and have succumbed to debt traps, financial security is crucial to encourage a step towards transformation
<i>"I spoke to a few organizations and other third parties to organize good millet and lentils seeds so that we can start to grow them on</i>	The farmers highlight how easy access to resources such as good seeds, especially for native or local climate resilient crops, could help

Table 2: Diverse strategies to accelerate transformation

our farms and later on breed them by ourselves. Let's see if that works out."	in behavioural shifts among other farmers. This could also provide them empowerment and self-reliance.
"I believe <b>if they are provided with good millet</b> <b>seeds, they will shift their behaviours towards</b> <b>growing food crops</b> . After a few cycles, we will be able to breed our own seeds."	
"With millets, the market price that we receive	The farmer highlights the need for conducive
is very low. Given our geographical location, we	markets that could encourage the growth of
do not have direct access to customers and we	local and native crops important for overall
do not see any middleman letting this happen in	systems well-being
this region. It is very political."	

#### 5.6 Conclusion

It can be concluded that farmers' daily experiences have shaped their nuanced understanding of the interconnections between their farming methods, lifestyle, cultural values, and motivations, ultimately informing their recognition of the need for agricultural transformation. One of the key findings from this chapter is the awareness amongst the participant farmers about the challenges to agricultural transformation such as profit-driven mindset due to changing aspirations and motivations influenced by modern paradigms, loss of touch with traditional knowledge within the community and lack of interest in reviving it and a shift from collectivism to individualism within the community that is manifested in every aspect of their lives, especially in making decisions regarding farming. This finding suggests farmers' concrete understanding of context-specific issues that act as barriers to transformation. Another key finding from this chapter is identifying that a successful transformation towards regenerative practices requires a collective shift in mindset and behaviour, emphasizing holistic values, community empowerment, and the revival of traditional farming practices through strong community connections and collective action. In addition to this, there is one more key finding relating to the emphasis on the power of multi-stakeholder communication highlighting the need for an inclusive dialogue regarding the challenges and opportunities underscoring agricultural transformation. Such collaborative efforts through collective action and effective communication are necessary to channelize the motivations and values towards holistic agricultural approaches. This will not only regenerate lands and ecosystems but also regenerate the mindsets and societal connections within communities.

# Chapter 6 Discussion

#### 6.1 Introduction

This chapter will look into the complex interlinkages between farmers perceptions, (regenerative) agricultural practices, cultural beliefs and transformation in the tribal communities of Eastern Ghats, India. The findings reveal an intricate network of more-than-human interactions, cultural embeddedness, and transformative motivations and values of famers that contribute in shaping the agricultural landscape in the Eastern Ghats. The farmers involved in this study demonstrate a profound shift from conventional practices to regenerative approaches blending traditional knowledge and modern methods. Their perceptions of these practices and more-than-human interactions involved, reflect a deep understanding of ecological interdependencies, cultural heritage, personal and overall well-being, and the need for widespread transformation as identified in the findings. Building on the key findings, in this chapter, I make four main arguments.

The first main argument states that the relational network of interactions situated within the intuitive regenerative practices embody a place-based ethics of care that emphasizes understanding and nurturing of the complex web of interactions within a specific ecological and cultural context, promoting practices that care for more-than-human entities while engaging in transformative processes of empowerment and identity construction. This is linked to the findings on how farmers' decisions to adopt certain regenerative practices is a result of their attentiveness to their local context, respect for region-specific knowledge, and responsibility and responsiveness towards themselves, their farmlands and ecosystems. My second main argument explains re-learning and re-appreciating integrated traditional localized knowledge with localized cultural beliefs and practices embody deep respect and patience for living nature and shapes people's connection to their lands, community, and personal selves, also challenging human/nature dichotomies. This is linked to the key finding that revisiting traditional knowledge along with cultural beliefs has enabled farmers to experience interconnectedness and reciprocity in human-nature and human-human relationships. The third main argument emphasizes that collective mindset shifts with realigned motivations and values that are re-embedded within place-based cultural context are crucial for regenerative transformation to take place at a wider scale. This argument arises from the key finding identifying the need for behavioural shifts across community, emphasizing holistic values, and the revival of traditional farming practices through strong community connections and collective actions for meaningful transformation. My fourth main argument calls for a need of alternative ways of defining regenerative agriculture that must be dynamic, allocating space for place-based adjustments, participatory approaches and co-evolving understanding. This is a reflection of the finding highlighting the need for inclusive dialogue to understand challenges and opportunities underscoring agricultural transformation. I will explore these main arguments in-depth while answering the main research question of this thesis – how do more-than-human interactions within regenerative agricultural practices contribute to landscape transformation in the tribal communities of Eastern Ghats, India.

#### 6.2 Farmers' perception of more-than-human interactions

The tribal communities in the Eastern Ghats region of India have been experiencing degeneration of farmlands due to commercial overexploitation over the last few decades. The study findings have revealed that decreased productivity, soil erosion due to erratic weather patterns and losing natural vegetation cover have forced rural youth to lose respect and faith in agriculture and migrate to cities in search of better livelihoods. In addition to this, farmers have been succumbing to frequent illnesses which more often than not do not get treated as farmers are not in a position to incur heavy expenses from doctors and medications. These are a few among many negative effects that have coerced the famers (involved in this study) to start thinking 'care-fully' and paying attention to the debilitating patterns that are hampering their

livelihoods, personal well-being and the well-being of their lands and surroundings. They acknowledge the limitations of conventional, input-intensive farming practices that attempt to exert control over natural processes and recognize the need for a more adaptive and responsive approach. This prompted them to think holistically and adopt (regenerative) agricultural methods with a hope to restore and regenerate their ecosystems.

Although unfamiliar with the term "regenerative agriculture," these farmers have intuitively adopted practices that align closely with regenerative agriculture principles, blending traditional knowledge with contemporary scientific methods. Such intuitive adoption of practices by farmers demonstrates a concept of care as farmers recognize and learn from their place within a web of diverse relationships (Warren, 2000). The findings have revealed a complex web of interactions between farmers and their environment incorporating both human and non-human actors within these adopted agricultural practices. The participant farmers have elaborated upon how they perceive these interactions as relational and interdependent. I argue that this relational network of interactions within the adopted agricultural practices embody a place-based ethics of care that emphasizes understanding and nurturing of the complex web of interactions within a specific ecological and cultural context, promoting practices that care for more-thanhuman entities while engaging in transformative processes of empowerment and identity construction. For instance, farmers observation of changes in soil, biodiversity and crop quality after stopping using chemical inputs indicates a growing awareness of the interconnectedness between farming practices and soil health aligning with ethics of care that emphasizes attentiveness to the needs of others including more-thanhuman entities such as soil. This supports existing literature elaborating how caring practices arising from deep attentiveness to the dynamics of environment are often considered as manifestations of interdependence and nature connectedness (Puig De la Bellacasa's (2010) and Tschakert & St. Clair's (2013)).

As per the findings, farmers' decisions to prepare their own natural concoctions for nutrition and pest management using plant and animal products available in their surroundings highlights attentiveness to specific needs, conditions and resource management in a particular place and emphasizes the value given to self-reliance and empowerment. This aligns with and supports the idea of place-based ethic of care that emphasizes the importance of building and maintaining relationships within a specific locale (Ryan et al., 2023). The observations about increased earthworm and microbial population and their role in enhancing air circulation and water retention in the soil suggests that farmers are developing a more nuanced understanding of soil as a living ecosystem rather than just an inert growing medium and also realising the significant role of non-human elements in keeping their living ecosystem healthy. Such understanding of symbiotic relationships is also exhibited by farmers perceptions of the crop interactions experienced within the practice of intercropping. The knowledge gained from everyday interactions within the soil and between the intercrops and the main crop about cyclic nutrition and natural pest management exemplifies local, context-specific and place-based experiential learning where farmers are realising first-hand the agency of non-human actors (Goralnik & Nelson, 2017; Harmin et al., 2017). Farmer insights on improved soil health and their own personal health due to the adoption of regenerative practices suggest that they are developing a more relational perspective with their land, recognizing the interdependencies between their practices and the role of more-than-human actors involved in it within a particular place and context. This provides farmers a sense of groundedness and inspires a paradigm shift, recognizing nature as sentient and communicative. The adoption of regenerative agricultural practices serves as a site of enablement for farmers, as they engage in "attentive communicative contact", phrase used by Krzywoszynka (2016), with their land and crops, becoming both care-givers and care-receivers in a reciprocal relationship embodying values such as ecological well-being, economic resilience, and self-reliance. Through these practices, farmers also construct their identities and relational life in ways that are rooted and reflective. Based on this, it can be argued that by recognizing the agency of non-human actors and adopting a place-based, context-specific approach, these farmers not only embody ecological well-being and economic resilience but also engage in a transformative process of identity construction and empowerment through place-based experiential learning and knowledge sharing. This further supports the idea of identity construction being "situated, unique and embodied" (Morriggi et al., 2019).

#### 6.3 Contextualizing regenerative practices within cultural paradigm

The transformative process of identity construction and empowerment is further reinforced by cultural beliefs and traditional knowledge in which the adopted regenerative practices are rooted in. Farmers' view of their land as a nurturing mother and their belief in a symbiotic relationship with nature strengthens their identity as responsible stewards and custodians of the earth. Farmers' spiritual connections to their land, personifying natural elements as deities or guardians, embody a place-based ethics of care that fosters deep, familial-like relationships with their environment, motivating them to nurture and protect their ecosystem's health and resilience. Farmer's rituals, festivals, and spiritual practices reinforce cultural significance of farming and represent a form of communication and care for the land aligning with ethics of care involving recognizing the agency and subjectivity of more-than-human elements as mentioned by Krzywoszynka (2019). It also furthers their understanding of land and local ecosystem as active participants in care relationships and not just passive recipients. Escobar (2001) highlights that marginalized communities employ place-based strategies, rooted in deep ethical commitments and cultural practices, to assert agency and resist global forces while prioritizing the well-being of both people and their environment. This is demonstrated in the study findings where farmers elaborate upon how connection to farmlands arising from traditional cultural beliefs for some tribal communities serves as a resistance to capitalistic forces and modern agricultural paradigm. Farmers perceive that such adherence to place-based cultural and traditional systems has enhanced the resilience and well-being of these tribal communities, fostering a deeper connection to their environment, place and agricultural practices. This strengthens the thought - "Communities that maintain their cultural practices are more resilient, with a stronger sense of identity and place" (Pretty et al., 2009).

Cultural beliefs are deeply intertwined with traditional knowledge. Re-learning of time-honoured practices such as intercropping, natural seed breeding and cultivation of native crops not only enhance ecological well-being but also are culturally significant fostering a sense of continuity and respect for ancestral wisdom amongst the participant farmers. Farmers ethical choices to grow native crops suited for their localized context and engage in localized seed breeding exemplifies their re-appreciation of traditional ways of farming. These practices empower farmers, granting them a sense of autonomy and self-provisioning (Van der Ploeg, 2015) and extend beyond farmland into their lifestyles. For instance, the native crops such as millets, noted for their superior taste and nutritional value, when used for subsistence have improved farmers health and strengthened their cultural connections. These practices are understood to be aimed at promoting conservation, sustainable resource management and self-reliance. I argue that re-learning and re-appreciating integrated traditional localized knowledge with cultural beliefs and practices of that place embody a deep respect and patience for living nature and shapes people's connection to their lands, community, and personal selves. Such integration of traditional knowledge and cultural beliefs epitomizes place-based ethics that transcend anthropocentrism, fostering a commitment to caring for more-thanhuman actors within broader socio-ecological relationships and cultivates a strong, culturally grounded connections (Duncan et al., 2021; Hassink et al., 2020; Seymore, 2021, Berkes F., 1999). Traditional knowledge coupled with cultural beliefs and practices serve as tangible links to the past, helping individuals understand their cultural roots and heritage. Farmers perceive traditional farming as a holistic philosophy ('a way of life') strengthening intimate connections with nature, enabling continuous learning and deep understanding of ecological relationships, rather than perceiving farming as merely a set of agricultural practices. This deepens farmers' understanding of themselves as integral parts of nature, akin to any other living entity, contributing to maintaining ecosystem health. This reciprocal and relational understanding between farmers and their land fosters a sense of identity as land stewards, promoting togetherness, place attachment, and belonging within the community. This also cultivates a sense of responsibility within the farmers demonstrated by their eagerness to share and promote integrated traditional farming methods

within their community, aiming to foster togetherness and enhance overall ecosystem well-being. This collective approach to farming and land stewardship contributes to the ongoing co-constitution of place, as farmers actively shape their environment through their farming practices while being shaped by it. This analysis from the findings is further strengthened by Tuan, Yi Fu's (1977) argument that places gain their meaning through human experiences and cultural narratives, which in turn shape ethical considerations and care practices. It can be argued that the intuitive practices identified in the findings represent a synthesis of traditional wisdom and contemporary ecological understanding embedded in cultural beliefs and values situated in a particular place and reinforce farmers' identity as change makers and land stewards, responsible for nurturing ecosystem well-being and also inspiring other farmers towards landscape transformations using regenerative approaches. This supports existing argument that traditional knowledge, inherently place-based, encourage communities to live sustainably and in harmony with land fostering reciprocal relationship with nature (Kimmerer, 2013).

#### 6.4 Farmers insights on transformation: Motivations, values and objectives

According to the research findings, the participant farmers who have adopted regenerative practices, nurture a mindset that allows them to view the interactions within their environment in a relational and interconnected manner. They have shown systemic thinking by shifting their priorities to long-term ecosystem resilience and sustainability over short- term financial gains. Their adopted regenerative practices manifested in ethical considerations and caring relationships with more-than-human entities involve deep respect and reciprocity for all living forms. Place-based care practices emphasize the crucial role of understanding the specific ecological and cultural context of a particular locale. Aligning regenerative methods with unique conditions and needs of local environment leads to effective sustainable outcomes. It can be argued that place-based experiential learning allows individuals and communities to deeply understand, connect and adapt to their local environment, fostering a regenerative mindset that is responsible, responsive and adaptable to specific ecological contexts. This finding supports the argument presented by Giller et al., 2021 on how landscape transformations using regenerative methods require fundamental mindset shifts from reductionist views to a systems thinking approach. The regenerative mindset, identified in the findings, contrasts with extractive or degenerative approaches that deplete resources and degrade ecosystems over time.

The findings suggest that the feeling of responsibility and responsiveness towards their local environment has enabled the farmers to start understanding how the deep-seated profit-driven extractive attitudes and values promoted by modern agricultural paradigm act as a barrier to the much needed physical (landscape) and mental (mindset shifts) transformation across communities. Farmers observations on changing aspirations of farming communities especially the ones residing on the rural-urban fringe exemplifies localized capitalistic impact and thus needing tailored, place-specific strategies for meaningful agricultural transformations. Similarly, the finding about farmers realization about prevailing mindsets perceiving humans separate from their ecosystems attributing to the loss of traditional localized knowledge signifies the crucial role of place-based traditional knowledge and cultural practices in fostering strong land-community connections and challenging human-nature dichotomies. The farmers note that a shift from community-centric to individualistic approaches erodes a sense of belonging and further impedes transformation. This suggests that farmers view transformation as encompassing both the adoption of regenerative practices and cultivation of regenerative mindsets, deeply anchored in place-based care ethics and practices that are relational and interdependent.

From the findings, it can be inferred that a relational and holistic understanding of agricultural systems transformation within their geographies has led farmers to recognize that it is not an individual pursuit, rather a collaborative effort rooted in strong community ties and collective mindsets and actions. This can be exemplified by farmers anecdote of growing millets together to minimize the damage caused by pests/birds, ensuring risk management for community as a whole. The emphasis on reviving strong communal bonds and the need for community to work together is expressed by farmers as a way to care for well-being of the community along with the well-being of ecosystem which eventually foster a sense of belonging and empowerment. This will also help in aligning motivations across the community and re-embed

values of unity within community in their current cultural paradigm. It can be argued that collective mindset shifts with realigned motivations and values that are re-embedded within the cultural context are crucial for transformation to take place at a wider scale. This is in alignment with the argument that mindset shifts are crucial to make long term sustainable changes in human behaviour and human-nature relations (Seymour & Connelly, 2023). This is demonstrated by farmers emphasis on realizing true transformative potential of traditional farming practices through collective engagement in experimentation and adoption. This requires effective communication across multiple stakeholders as mentioned by the participant farmers in the findings. This approach recognizes complex interconnections within agricultural systems and the need for diverse perspectives to drive meaningful transformation.

#### 6.5 Redefining regenerative using place-based ethics of care

As discussed in the previous section, transformation can essentially be characterized by relational aspects such as reciprocity, respect, mutuality, trust and interdependence between human and non-human entities in the environment. Shifting mindsets or the discourses that shape the way people conceptualize reality can be considered more integral to transformative change than prescriptive definitions including practices, principles and outcomes relating solely to landscapes demonstrating lack of theoretical depth and consistency (Gordon et al., 2021; Sands, 2023). Currently, such prescriptive definitions of regenerative agriculture in Western academics lack sociological and relational values rooted in traditional localized knowledge and cultural beliefs (Sands, 2023). 'Regenerative agriculture' as a term was coined in 1980s but the knowledge and practices that it represents, as per the definitions today, has been possessed and followed across many cultures all over the globe. The geography presented in this research inhabited by tribal farming communities also followed regenerative farming approaches across generations until modern agricultural concepts of farming crept in. This traditional farming knowledge possessed by the previous generations in the Eastern Ghats region was based on constituting lives in harmony with nature. It recognized the more-than-human connectedness and interdependencies of interactions within their farming practices and the rootedness and attachment to their place and lands.

The current farmers involved in this research are oblivious to the term 'regenerative agriculture'. However, the shifting of their mindsets and farming methods stem from their re-appreciation and reverence for their place-based traditional knowledge and cultural values. Their adopted practices are rooted in their motivations and values of caring for and nurturing their 'motherlands' challenging the existing human/nature binaries, a result of dominant capitalistic narratives. As the findings suggest, the adopted farming practices are a blend of traditional knowledge with contemporary approaches in order to combat anthropocentric issues. However, the shift in mindsets can be attributed to farmers going back to their roots and get in touch with their socio-cultural values emphasizing strong attachment to human-human, humannature and human-place bonds. This implies that the concept of regenerative agriculture goes way beyond the current practices and outcomes-based definitions and can be considered as a transition narrative where humans are attempting to shift from being destructive forces to the ecosystems to being responsible agents focussing on mutually benefitting their environments (Escobar, 2015). It could be argued that definitions of 'regenerative agriculture' must be dynamic, allocating space for place-based adjustments, participatory approaches and co-evolving understanding. This aligns with the concept of 'epistemological stretching' fostering different ways of knowing, supporting a holistic understanding of place, valuing diverse perspectives and knowledge systems, especially making visible the marginalized knowledge systems (traditional knowledge to comprehend environmental decision making (Harmin et al., 2014). This is crucial especially for farmer such as the ones involved in this thesis who have succumbed to financial insecurities, political inefficacies and the community-wide loss of socio-cultural values. The gap between current western definitions of regenerative agriculture and the intuitive adoption of traditional practices rooted in placebased approaches can often neglect farmers of opportunities supporting agricultural transformation at a wider scale. For example, agricultural transitions at present are often cost intensive. Farmers do not have enough financial security or support to engage in any transformative process and thus shy away from adopting regenerative farming methods. Broadening the scope to define regenerative agriculture could help realise the true potential of transformation and hence help various stakeholders to understand and implement place-based strategies providing support to farmers towards a meaningful change. Similarly, this scope must widen up to incorporate often marginalized traditional localized knowledge and cultural values crucial for fostering holistic motivations amongst the farming community.

#### 6.6 Conclusion

As discussed in this chapter, farmers perspectives on more-than-human interactions within their intuitive regenerative agriculture practices are inherently relational and place-based. These interactions are embodied in a place-based ethics of care emphasizing the acknowledgement of interdependencies and interconnections within the interactions between human and non-human entities situated within a specific geographical and cultural context. This fosters an ethical responsibility amongst farmers reflected through care practices towards more-than-human entities while undergoing shaping of identities and feeling a sense of empowerment. This is further strengthened by traditional localized knowledge coupled with the cultural beliefs and values nurturing feelings of reverence and mutuality with nature and moulding their connections with themselves, land and community. Such relational connections reinforce the view of being one with nature rather than being separate from it. Developing relational perspectives and systemic thinking through engaging in regenerative practices emphasizes the significance of a regenerative mindset that focuses on working towards thriving communities and resilient ecosystems. This particular case study highlights an urgent need for collective mindset shifts with re-embedded values and realigned motivations within the community for meaningful regenerative transformations at a wider scale. The analysis of the findings of this case study further highlights the need for a different way of defining regenerative agriculture that includes place-based understandings and participatory approaches. The context-specificity and localized ontologies are vital aspects creating a lens which could be used to understand the true potential of regenerative transformations.

# Chapter 7 Conclusion

#### 7.1 More-than-human interactions contributing to regenerative transformations

From the findings and discussion chapters, it is identified that the farmers who have intuitively adopted regenerative practices in the Eastern Ghats have developed a relational and systemic thinking towards their ecosystems. Farmers elaborations on their perceptions towards more-than-human interactions within their practices has established a relational and interconnected lens using which they view their farming approaches to be reciprocal and mutual. Through these mutually beneficial and harmonious relationships with nature, these farmers are able to understand the agency of more-than-human entities and identify themselves with values of self-reliance, empowerment and autonomy. For instance, farmers decisions to prepare their own natural concoctions and grow native and local crops have helped them gain in-depth knowledge about their natural surroundings and local or regional markets, experience efficient natural resource management and also enable themselves to rely less on the middleman. The attentive and carefull interactions with non-human actors have led farmers realize the significance of going back to their roots where farming was a philosophy that promoted human living deeply integrated with nature well-being. By re-learning their traditional farming knowledge and re-embedding their cultural beliefs, these farmers have experienced a transformative shift not just in their physical lands but also in their relationships with themselves, community and ecosystem as a whole. Exploring more-than-human interactions with care and empathy have re-shaped their identity as land stewards and change makers who are responsible for taking care of their environment. Such reflections encourage these farmers to push other farmers in the community by helping them to undergo regenerative transformation. These farmers are first experimenting with regenerative practices themselves and then showing it to other farmers in the community to instil strong trust in their regenerative ways. Farmers sometimes guide other farmers through the initial cycles of adopting regenerative practices to minimize risks and ensure successful transitions. One important finding from this thesis is farmers recognition of effective communication involving his multiple-stakeholders involved within their agricultural systems highlighting the significance of participatory approaches and collaborative decision-making towards nurturing the well-being of ecosystems.

It can be concluded that relational more-than-human interactions within regenerative practices embedded in the traditional farming approaches and cultural context of this case study contribute strongly towards fostering a regenerative mindset which in turn leads to meaningful landscape transformations. This case study suggests that regenerative agriculture is not just a mere set of technical practices that are good for soils and crops but a way of living involving collective mindset shifts towards holistic understanding of human-nature-place nexus. A place-based ethic of care is central to comprehending farmers perspectives and understanding about the transformative potential of regenerative agriculture. Using this lens helps analyse the reasons influencing farmers decision-making relationally and holistically. All the sections in the discussions chapter put together demonstrate how place-based traditional knowledge, cultural beliefs and values, and realignment of motivations across communities are required to be re-embedded in the current cultural paradigm to experience meaningful transformations. Relational network of interactions within regenerative practices as perceived by farmers exhibits their placement within the more-than-human world and the importance they give to connections with their lands, other individuals in the community and overall ecosystem focussing on the construction of their identities, empowerment and well-being of the ecosystem that they are a part of. Thinking, being and doing regeneratively encourages a fundamental shift away from reductionist and extractivist based models to collaborative, caring and inclusive approaches. Such approaches and thinking stemming from understanding interactions within farming practices can result in transformation not just of landscapes but also of living systems.

#### 7.2 Real world application of this research

The existing literature on regenerative agriculture in India mostly focusses on looking at the ecological and economical outcomes. This thesis significantly enriches the existing literature by examining the

transformative potential of regenerative agriculture in India using relational sociological dimensions. The emphasis on place-based nature of regenerative agriculture also serves an important purpose of identifying context-specific challenges and thus recognizing appropriate tailored solutions that could potentially encourage communities belonging to specific regions engage with regenerative agriculture. The smallholder farmers in this case study are the most vulnerable part of a big complex network of stakeholders involving middleman, marketplaces, governmental and private organizations and civil-society bodies involved within their agricultural system. Elaborating on these farmers' perspectives and experiences with regenerative agriculture can provide meaningful insights on what the place-specific issues are, what they feel connected to (their cultural inclinations), what they aspire for and what drives their sustainable motivations. These insights can be helpful in designing inclusive and holistic policies including participatory approaches and integrating place-specific traditional farming knowledge and cultural beliefs. For instance, from this thesis, it can be inferred that farmers need support in transitioning to regenerative practices which can be financial or in the form of conducive markets for millets and pulses and accessibility to good seeds for native crops in that region. This thesis has established the significance of understanding farmers perspectives on farming since there is limited literature especially in India capturing the voice of smallholder farmers regarding regenerative agriculture and agricultural transformation overall.

An important aspect of regenerative approach – regenerative mindset has been explored in this thesis. Regenerative mindsets are considered to be a key element to agricultural transformations. It is realized that relationships formed with such mindsets are essentially interdependent, reciprocal, collaborative and carefull (Seymour, 2021). This implies that if regenerative mindset is embedded in the field of environmental management, ecosystems well-being will be perceived as a network of social, ecological and economic factors. The decisions would be recognized within a framework of collective responsibility that work towards holistic and systemic changes and correcting structural injustices involved in transformations (Seymore, 2021). Governmental bodies and other social development organizations can fund programmes that document and disseminate traditional localized farming knowledge. Place-based understanding can further help institutional bodies to draft policies that are culturally sensitive and inclusive of local spiritual and cultural values and practices. Place-based approaches can guide multiple stakeholders to understand the needs and challenges associated with the transformation in a particular place relationally and empathetically. Integrating place-based ethics of care into sustainable agricultural policies can produce frameworks that are ecologically sound, culturally respectful and socially equitable. This thesis also contributes to limited existing literature on understanding agri-food systems transformations using a sociological dimension. Place-based ethics of care framework has not been used for regenerative agriculture as yet. This thesis is an extension of more-than-human care ethics as described in existing literatures, emphasizing the importance of place-based ethics of care in shaping more-than-human relations which in turn shape the places of food production that are considered as social and cultural sites of engagement.

#### 7.3 Limitation of this research

There are practical limitations associated with this research attributed to its scope and scale. Firstly, this research only captures the perspective of farmers (one stakeholder within a complex value chain). Another limitation that constricts the scope of this research is time constraint. Adding to this, the participant farmers involved with this research are the ones who have already shifted away from modern agricultural practices to implementing a blend of traditional practices with contemporary approaches. Capturing the views of farmers who are not involved in regenerative farming practices and other stakeholders involved in this value chain can give more rounded insights into how they perceive this entire movement and transformation. The quantity of data and synthesized themes using coding is vast, but not all themes have been included within this research due to its limited scope. The farmers in this research recognize the barriers to transformation such as socio-political factors and absence of participation from all stakeholders, but due to scope limitations those voices have not been captured. Also, the representation of female farmers in the research is less as compared to the male voices. This is due to socio-cultural restrictions that inhibit women from elaborating on their opinions and thoughts. Therefore, many conversations involving other stakeholders, are required to understand the transformation of agri-food systems within the farming communities in India. This research serves as a starting point in this direction.

#### 7.4 Potential of place-based care ethics

This research has explored the perspectives of farmers on interactions within their regenerative agricultural practices and their understanding about transformative changes using a place-based ethics of care lens. Care theory is being used as a theoretical framework to understand regenerative farming practices through the perspective of care ethics focussing on relationships, responsibilities and attentiveness to both human and non-human actors in the agricultural system. Care ethics is further used by the researcher as a guiding principle in conducting the field research approaching the tribal communities with empathy and sensitivity recognizing their vulnerable socio-political status. Using place-based ethics gives a glimpse into how care is manifested in the adopted practices of participant farmers in terms their relationship with soil, plants, animals, and ecosystems as well as their communities and future generations. Such socio-ethical concepts foster discussions and debated beyond the usual political economic approach (Gottschlich and Bellina, 2017). The application of place-based care ethics is a response to calls for more diverse and comprehensive ways of understanding transformative changes in agri-food systems (Tregear, 2011). This thesis encourages using place-based care theory as a holistic way of understanding the true potential of transformation through regenerative approaches.

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